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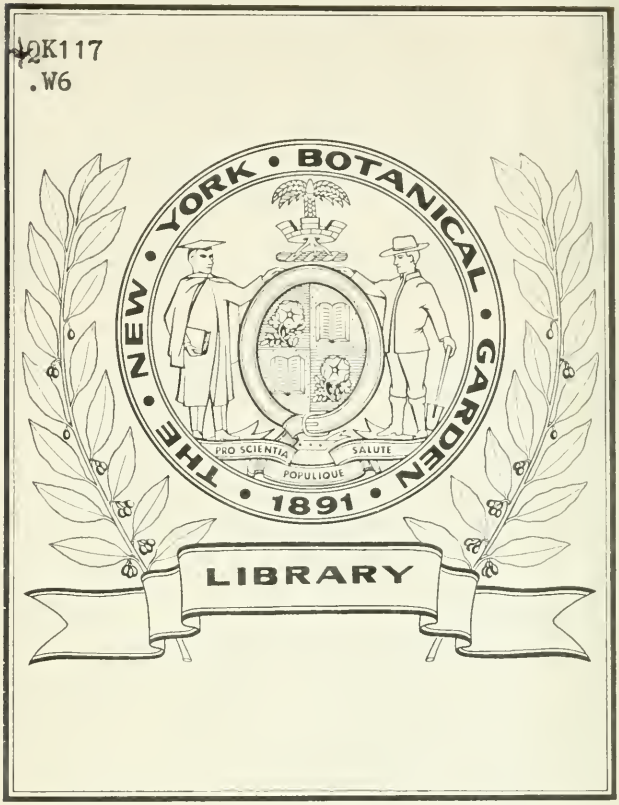
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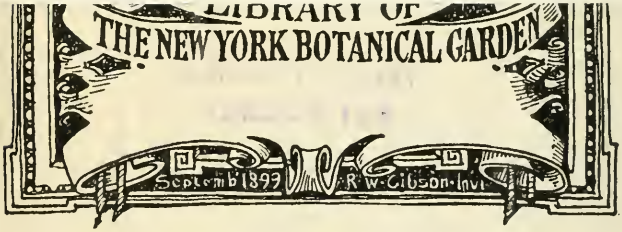
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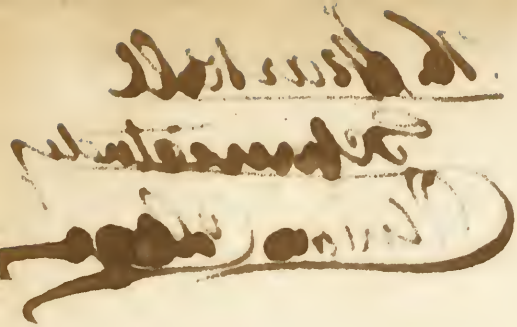

A

CLASS-BOOK OF BOTANY,

DESIGNED FOR

COLLEGES, ACADEMIES, AND OTHER SEMINARIES

WHERE THE SCIENCE IS TAUGHT.

In Two Parts:

PART I.

THE ELEMENTS OF BOTANICAL SCIENCE.

PART II.

THE NATURAL ORDERS,

ILLUSTRATED BY

A FLORA OF THE NORTHERN UNITED STATES,

PARTICULARLY NEW ENGLAND AND NEW YORK.

BY ALPHONSO WOOD, A. M.

ASSOCIATE PRINCIPAL IN KIMBALL UNION ACADEMY.

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TO THE

REV. CHESTER DEWEY, M. D., D. D.,

PROFESSOR OF NATURAL SCIENCE IN THE BERKSHIRE AND OTHER MEDICAL INSTITUTIONS, AUTHOR OF THE REPORT ON THE HERBACEOUS PLANTS OF MASSACHUSETTS, MONOGRAPH ON THE CARICES, ETC. ETC.

THIS VOLUME

IS RESPECTFULLY DEDICATED, BY

THE AUTHOR.

PREFACE.

That there is need of a new Class-Book of Botany, prepared on the basis of the present advanced state of the science, and, at the same time, adapted to the circumstances of the mass of students collected in our institutions and seminaries of learning, is manifest to all who now attempt either to teach or to learn. The time has arrived when Botany should no longer be presented to the learner encumbered with the puerile misconceptions and barren facts of the old school, but as a System of Nature, raised by recent researches to the dignity and rank of a science founded upon the principles of inductive philosophy. The study of this science through the medium of the system of Jussieu, is adapted, not merely to the amusement of the mind, but eminently to its discipline; and needs no longer to be excluded from popular pursuit by cumbrous and costly tomes. That theory of the floral structure which refers each organ to the principle of the leaf, long since propounded in Germany by the poet Goethe, and recently admitted, by authors generally, to be coincident with facts, is adopted, of course, in the present work. Entering into almost every department of the science, it has given a new aspect to the whole face of it; and it reveals, more clearly than any other discovery has ever done, the beauty and simplicity of that plan on which Creative Power is exerted in the production of the countless forms of vegetable existence.

How far the present work may be adapted to the diffusion of this important science, in its present advanced state, a candid public must determine. I have undertaken and accomplished it, thus far, from a thorough conviction of my own need of such aid as is here contemplated, both in acquiring and imparting knowledge in this department of natural history.

The First Part contains a summary of the Elements of Botany, according to the latest authorities, written in the form of simple propositions, briefly illustrated, and broken into short paragraphs with direct reference to the convenience of the learner. Brief as it is, it is hoped that it will be found to embody all the established principles of the science contained in former school treatises, together with those newly discovered principles in Organography and Physiology, by which the science has been really enriched and advanced.

The Flora comprehends all the Phænogamous plants, with the ferns, &c.,

which have hitherto been discovered, and described as indigenous to the New England States and New York, together with the naturalized exotics, and those which are more generally cultivated, either as useful or ornamental. The descriptions are as extended and minute as appears to the author necessary for the complete recognition of the plants, and for imparting a knowledge of whatever is peculiar or interesting in their habits, culture, or use.

With regard to the sources of information from which this part of the work has been prepared, it is proper to state, that I have for several years been engaged in the collection of materials, during which I have made frequent and extensive tours with this object in view, in nearly every section of country which this Flora represents; and have had access to many extensive collections of plants, among which I mention with peculiar pleasure that of Mr. Abel Stores, of Lebanon, N. H. By these means I have been able to draw the description of about three fourths of the species mentioned in the work from the living or dried specimen. The remaining descriptions are compiled from a careful examination and comparison of the best authorities within my reach, among which are the botanical works of Bigelow, Eaton, Wright, Nuttall, Pursh, Smith, Torrey (his Northern Flora), Beck, London, Barton, Michaux, Darlington, Dewey, &c., &c. To the elaborate and highly authentic Flora of Drs. Torrey and Gray, I had no access until after the present Flora had been written: since which time I have availed myself of their researches in regard to the nomenclature of plants, succession of the Orders, and recent discoveries. In almost all cases, I have adopted their generic and specific names, for very obvious reasons. The multitude of synonyms, by which plants have been heretofore designated, have greatly encumbered the science, and are to be regarded as an evil and only an evil. If we then have a *standard* work on North American Botany, written by North American authors, as we most certainly have, it is absurd for humbler writers to strive to perpetuate this useless jargon of names. Beyond Order LXXVI, to which only their work as yet extends, I have adopted those names which, in my own judgment, rest upon the best authority.

There are two serious evils existing in the treatises in more general use, which have too long checked the diffusion of botanical knowledge. First, the principles of the science are reduced to such a degree of simplicity as to sacrifice all incentive to intellectual effort, save memory alone; and, secondly, the application of the principles in practical analysis is often involved in such obscurity that no degree of intellectual effort is of any avail. In the following pages I have guarded against both these evils as much as possible. With regard to the latter, it is hoped that the Analytical Tables will be found of essential service. The object aimed at in their construction, is, to exhibit at one view the most striking characteristics of each group, to which they respectively relate, so arranged as to conduct the mind from a single *radiating* point, to any desired genus described in the volume. That we have fully realized this plan, or that the tables are free from error, is not to be expected; yet we do hope that they will afford facilities for analysis far greater than any system hitherto available.

In the construction of these tables I have received indispensable aid from Dr. Edward E. Phelps, of Windsor, Vt., Lecturer on Medical Botany, in

Dartmouth College. I would here gratefully acknowledge, also, the important assistance and encouragement I have received from him in other departments of this work.

To the Rev. Professor Dewey, to whom I am permitted to dedicate this volume, I am indebted for that part of the Flora which relates to the difficult, yet deeply interesting, family of the Carices. He has not only granted me access to his former excellent Monograph on that genus, but has prepared the article for the present work with his own hand.

The six Primary Classes of the Vegetable Kingdom, adopted in this volume, differing somewhat from Torrey and Gray, to whose arrangement I have so generally adhered in other respects, rest upon the authority of Prof. Dewey, and others. The *Gymnosperms* of Lindley are made a coördinate class with that of *Exogens*, and yet are at the same time acknowledged to be only a subdivision of it; an arrangement which certainly appears to us illogical.

Finally, that the present work contains many imperfections, no one can be more fully aware than the author. These it will be his constant care to detect and amend in future editions, should any appear. Meanwhile, he confidently relies upon the indulgence of all those who can appreciate the difficulties attendant on a work like this, and humbly hopes that his long and arduous toil will not prove wholly unproductive of useful results.

Meriden, N. H., June 22, 1844.

THE GREEK ALPHABET, &C.

Large.	Small.	Rom. letters.	Names.
Α	α	a	Alpha.
Β	β	b	Beta.
Γ	γ	g	Gamma.
Δ	δ	d	Delta.
Ε	ε	ĕ	Epsílon.
Ζ	ζ	z	Zeta.
Η	η	ē	Eta.
Θ	ϑ θ	th	Theta.
Ι	ι	i	Iota.
Κ	κ	c, (k)	Kappa.
Λ	λ	l	Lambda.
Μ	μ	m	Mu.
Ν	ν	n	Nu.
Ξ	ξ	x	Xi.
Ο	ο	ŏ	Omíkron.
Π	π ϖ	p	Pi.
Ρ	ϱ	r	Rho.
Σ	σ, ς	s	Sigma.
Τ	τ	t	Tau.
Υ	υ	y	Ūpsílon.
Φ	φ	ph	Phi.
Χ	χ	ch	Chi.
Ψ	ψ	ps	Psi.
Ω	ω	ō	Ōmega.

Numerals.

1. εἷς, μονας.
2. δυω, δις.
3. τρεις.
4. τεσσαρες, τετρας
5. πενιε.
6. ἑξ.
7. ἑπτα.
8. οκτω.
9. εννεα.
10. δεκα.
11. ἑνδεκα.
12. δωδεκα.
20. εικοσι.

Many, πολυς.

Upon, επι.

Around, περι.

Under, ὑπο.

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* An apology for introducing the above tables in this place is scarcely due. A very large proportion of the botanic vocabulary, including generic and specific names, is derived from that most copious, rich, and beautiful of all languages, the Greek; and in explaining the etymology of these terms, instead of presenting their themes under the disguise of Roman letters, a practice always displeasing to the classical student, I have not hesitated to introduce them in their own proper Greek dress. Nor will this occasion the least difficulty to the English student, since, in all cases, the corresponding English words immediately follow the Greek thus introduced. It will be, however, both profitable and interesting to him, to make himself thoroughly acquainted with the above tables, as one of his lessons, preliminary to the study of botany.

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BOTANY.

CHAPTER I.

INTRODUCTION.

1. Botany is the science which treats of the Vegetable Kingdom. It includes the knowledge of the habits, structure, and uses of plants, together with their nomenclature and classification.

2. Like its kindred sciences, it is resolved into distinct departments, according to the nature of the subjects to which it relates. That part which investigates the organic structure of vegetables, is called Organography, corresponding to Anatomy, in the science of Zoology.

3. That part of botany which relates to the phenomena of the vital functions of plants, is called Vegetable Physiology; including the consideration of their germination, growth, and reproduction. It has, therefore, a direct and practical bearing upon the labors of husbandry, in the propagation and culture of plants, both in the garden and in the field.

4. Another department, of essential importance, is Glossology, which relates to the explanation and application of botanical terms, whether nouns or adjectives, by which the organs of plants, with their numerous modifications, are designated.

5. A fourth department, called Systematic Botany, arises from the consideration of plants, in relation to each other, their mutual affinities, and their endless diversities, whereby the 100,000 species, supposed to exist, may be arranged, classified, and designated, by distinctive characters and names.

6. Finally, in its extended sense, Botany comprehends, also, the knowledge of the relations of plants to the other departments of nature, particularly to mankind. The ultimate aim of its researches is, the development of the boundless resources of the vegetable kingdom for our sustenance, protection, and enjoyment; for the healing of our diseases, and the alleviation of our wants and woes.

7. This extensive department of Natural History, therefore, justly claims a large share of the attention of every individual, not only on account of the aid it affords to horticulture, to the employments of rural life, and to the healing art, but also for the intellectual and moral culture, which, among other kindred sciences, it is capable of imparting in an eminent degree.

a. No science more effectually combines pleasure with improvement, than Botany. It conducts the student into the fields and forests, amidst the verdure of spring, and the bloom of summer;—to the charming retreats of Nature, in her wild luxuriance, or where she patiently smiles under the improving hand of cultivation. It furnishes him with vigorous exercise, both of body and mind, which is no less salutary than agreeable, and its subjects of investigation are all such as are adapted to please the eye, refine the taste, and improve the heart.

8. The natural world, by distinctions sufficiently obvious, is divided into three great departments, commonly called the Mineral, Vegetable, and Animal Kingdoms.

a. Vegetables, or plants, hold an intermediate position between animals and minerals: while they are wanting in both the intelligence and instinct of the former, they are endowed with a physical organization, and a living principle, whereby they are remarkably distinguished above the latter; they constitute the ultimate nourishment and support of the one, the vesture and ornament of the other.

9. A *mineral* is an inorganic mass of matter, that is, without distinction of parts or organs. A stone, for example, may be broken into any number of fragments, each of which will retain all the essential characters of the original body, so that each fragment will still be a stone.

10. A *plant* is an organized body, endowed with vitality but not with sensation, composed of distinct parts, each of which is essential to the completeness of its being. A *geranium* is composed of organs, which may be separated or subdivided indefi-

nitely, but no one of the fragments, alone, will still be a complete plant.

11. Animals, like plants, are organized bodies, endowed with vitality, and composed of distinct parts, no one of which is complete in itself; but they are raised above either plants or minerals, by the power of perception.

a. These distinctions, long since suggested by the immortal Linnæus, are perfectly obvious and definite, in the higher grades of the animal and vegetable kingdoms; but, in descending the scale, we recognize a gradual and constant approach, in both, to inorganic matter, and consequently to each other; so that, in the lowest forms of life, all traces of organization disappear, and the three great kingdoms of nature, like three converging radii, meet, and blend in a common centre.

12. Vegetation, in some of its forms, appears to be *coextensive with the surface of the earth.* It springs up, not only from the sunny soil, moistened with rain and dew, but even from the naked rock, amidst the arid sands of the desert, in thermal and sulphurous springs, in arctic and alpine snows, and from the beds of seas and oceans.

a. Among the multitude of natural causes which affect the growth of vegetation, the action of the sun, through the light and heat which it imparts, is the most efficient. This is most powerful at the equator, and gradually diminishes in intensity, as we proceed from thence towards either pole. Vegetation, therefore, arrives at its highest degree of luxuriance at the equator, and within the tropics. In the temperate zones it is less remarkable for the beauty and variety of its flowers, and the deliciousness of its fruits, than in the torrid; yet it is believed to be no less adapted to promote the arts of civilized life, and the well-being of man in general. In still higher latitudes, plants become few, and of stinted growth, until finally, within the arctic circles, they apparently, but not absolutely, cease to vegetate.

b. Since climate is affected by elevation above the level of the sea, in the same manner as by increase of latitude, we find a similar diminution of vegetable activity, in ascending high mountains. Thus, the peak of Teneriffe, situated on a fertile island, within the tropics, is clothed, at different elevations, with plants peculiar to every latitude, in succession, from the torrid to the frigid zones, while the summit, being always covered with snow, is as barren as the region of the poles. So also the White Mountains, in New Hampshire, exhibit upon their summits a vegetation similar to that of Labrador, or even Greenland.

c. One of the first requisites for the growth of plants, is a soil, from which, by means of roots, they may derive their proper nutriment and support. But numerous species of lichens and mosses find their most congenial habitations upon the bare rock. The coral island no sooner arises to the surface, than it arrests the

floating germs of vegetation, which soon clothe the rough rock with verdure of a humbler kind, and ultimately, by the growth and decay of successive generations, form a soil for the sustenance of the higher forms of vegetable life.

d. Another important requisite is moisture. But the arid sands of the great African desert are not absolutely destitute of vegetable life. Even there, certain species of Stapelia are said to flourish, and those dreary regions, where neither rain nor dew ever falls, are occasionally enlivened by spots of verdure, like islands in the ocean.

e. Extremes of heat are not always fatal to vegetation. In one of the Geysers of Iceland, which was hot enough to boil an egg in four minutes, a species of Chara has been found, in a growing and fruitful state. A hot spring at the Island of Luzon, which raises the thermometer to 187°, has plants growing in it and on its borders. But the most extraordinary case of all, is one recorded by Sir J. Staunton. 'At the Island of Amsterdam a spring was found, the mud of which, far hotter than boiling water, gave birth to a species of liverwort.' Other similar instances are on record.

f. Nor are the extremes of cold fatal to every form of vegetation. The reindeer lichen, of Lapland, grows in vast quantities beneath almost perpetual snows. And far in the arctic regions, the eternal snows are often reddened, for miles in extent, by a minute vegetable of the Algæ tribe, called red snow, of a structure the simplest that has yet been observed, consisting of a single round cell containing a fluid.

g. Light is also a highly important agent in vegetation; yet there are plants capable of flourishing in situations where it would seem that no ray of it ever entered. Mushrooms, and even plants of higher orders, have been found growing amidst the perpetual midnight of deep caverns and mines. Sea weeds of a bright green color have been drawn up from the bed of the ocean, from depths of more than 100 fathoms.

13. The vegetable kingdom is no less remarkable for its *rich and boundless variety*, than for its wide diffusion. Plants differ from each other in respect to form, size, color, habits, structure, and properties, to an unlimited degree, so that it would be difficult, indeed, to find two individuals, even of the same species, which should perfectly coincide in all these points.

a. Yet this variety is never abrupt, never capricious; but here, as in other departments of nature, uniform resemblances are so blended with it, as to lay an adequate foundation for Systematic Botany.

14. The same causes which affect the general increase of plants, exercise, also, an important influence in determining their *character*. Hence, every climate has not only its own *peculiar degree* of vegetable activity, but also its *peculiar species*.

a. Other causes, besides temperature, are efficient in determining the species of

any given locality, such as the qualities of the soil, the degree of moisture both of the earth and skies, the inclination of surface, rocks, shades, and winds, the combined action of which often becomes an exceedingly complicated matter. Now to each of these innumerable combinations of circumstances, the Creator has adapted the constitution of certain species of plants, so that each given locality may be expected to produce its own appropriate kinds. But since some species are also endowed with the power of accommodating themselves to a wide range of circumstances, these are found more *extensively diffused*, while others, without this power, are comparatively *rare*.

15. Vegetation is susceptible of important changes by cultivation. Many plants are improved, in every desirable quality, by accommodating themselves to the conditions of soils enriched and enlivened by art. Examples are seen in almost every cultivated species.

16. The cabbage, in its wild state, is a slender, branching herb, with no appearance of a head. The potatoe, in its native wilds of tropical America, is a rank, running vine, with scarcely a tuber upon its roots. All the rich and delicate varieties of the apple have sprung, by artificial means, from the sour crab of Siberia. The numerous and splendid varieties of the Dahlia are the descendants of a coarse Mexican plant, with an ordinary yellow flower, of a single circle of colored leaves. The tulip and the geranium afford similar examples.

17. Changes, not only in the *qualities* of vegetation, are effected by culture, but also in the *species* themselves, through the substitution of the useful or the ornamental for the native products of the soil. Thus, in agricultural districts, almost the whole face of nature is transformed, by human skill and industry, from the wilderness to the fruitful field.

a. Hence it appears that there is scarcely a spot on earth which is not caused, by the quickening energy of the Creator, to teem with vegetable existence, in some of its numberless forms, while his goodness is conspicuous in rendering those tribes which are most subservient to the wants of man capable of the widest diffusion.

CHAPTER II.

PLAN OF VEGETATION.—ELEMENTARY ORGANS.

18. The earliest and simplest state of the plant is an *embryo* contained in a seed. This consists essentially of two parts, the *radicle* and *plumule;* the former about to be developed into the root, the latter into the ascending plant with its appendages.

19. As soon as the process of germination commences, the radicle begins to extend itself downwards in the direction of the earth's centre, constantly avoiding the air and the light, forming the *descending axis*, or root. The plumule, taking the opposite direction, extends itself upwards, always seeking the light, and expanding itself, to the utmost extent of its power, to the influence of the atmosphere. This constitutes the *ascending axis*, or trunk, around which the leaves and their modifications are arranged.

20. At the commencement of its growth, the ascending axis is merely a *bud*, that is, a *growing point*, enveloped in rudimentary leaves, or scales, for its protection. As this growing point advances, the enveloping scales expand into leaves below, while new ones are constantly appearing, in succession, above. Thus the axis is always terminated by a bud.

21. By this process the axis is elongated, simply in one direction. But, besides this, there is also a bud (or buds), either visible, or in a rudimentary state, formed in the axil of each leaf.

a. These axillary buds are generally visible, either before or after the leaf has fallen. In some plants, however, they seldom appear; but their existence is inferred from the fact, that even in such cases, they are occasionally developed in extraordinary circumstances.

22. Each bud is a *distinct individual*, capable of an independent existence, in favorable circumstances, although severed from the parent stock.

a. The common practice of propagation by layers, offsets, engrafting, and budding, is both a result and a proof of this principle. A plant may be, and

often is, in this manner, multiplied indefinitely, by the dissevered parts of itself, as well as by the seed.

23. But, remaining connected with the parent stock, axillary buds, a part or all of them, according to circumstances, are developed into *branches*, each of which may again generate buds and *branchlets* in the axils of its own leaves, in the same manner.

a. Thus, by the repetition of this simple process, the vegetable fabric is reared from the earth, a *compound being*, formed of as many united individuals as there are buds, and as many buds as there are branches and leaves, ever advancing in the direction of the growing points, by the depositiou of matter derived from the cellular tissue, clothing itself with leaves as it advances, and enlarging the diameter of its axis by the deposition of matter elaborated by, and descending from, the leaves already developed, until it reaches the limits of the existence assigned it by its Creator.

b. But the plant, reared by this process alone, would consist only of those parts requisite to its own individual existence, without reference to the continuance of its species beyond its own dissolution. It would be simply an axis, expanded into branches and leaves. But the Divine command, which first caused the tribes of vegetation, in their diversified beauty, to spring from the earth, required that each plant should have its 'seed within itself,' for the perpetuation of its kind.

24. At certain periods of its vegetation, therefore, a change is observed to occur in the plant, in regard to the development of some of its buds. From the diminished or altered supply of sap, received from the vessels below, the growing point ceases to lengthen in the direction of the axis, but expands its leaves in crowded and concentric whorls; each successive whorl, proceeding from the outer to the inner, undergoing a gradual transformation from the original type (a leaf), according to the purpose it is destined to fulfil in the production of the seed. Thus, instead of a *leafy branch*, the ordinary progeny of a bud, a *flower* is the result.

25. A flower may, therefore, be considered as a transformed branch, having the leaves crowded together by the non-development of the axis, and moulded into more delicate structures, and tinged with more brilliant hues, not only to adorn and beautify the face of nature, but to fulfil the important office of reproduction.

a. In the common peony, for example, as the leaves approach the summit of the stem, they gradually lose their characteristic divisions, and, at length, just

below the flower, become simple *bracts*, still retaining every essential mark of a leaf. Next, by an easy gradation, they appear in the *sepals* of the calyx, the outer envelope of the flower, still essentially the same. Then, by a transition rather more abrupt, they pass into the delicate and highly colored *petals* of the corolla, retaining still the form and organization of the *leaf*. To the petals next succeed those slender organs called *stamens*, known to be undeveloped leaves from the fact of their being often converted into petals. Lastly, those two central organs, termed *pistils*, are each the result of the infolding of a leaf, the midrib and the united edges being yet discernible.

26. When the flower has accomplished its brief but important office in reproduction, its deciduous parts fall away, and the remaining energies of the plant are directed to the development of the germ into the perfect fruit. This being accomplished, the whole plant speedily perishes, if it be an annual, or, if not, it continues to put forth new branches, from other growing points, which, in their turn, are to be terminated by flowers and fruit the following year.

a. Such is a very brief outline of the plan of vegetation, or the process of nature in the germination, growth, fructification, and decay of plants. And it is impossible to contemplate it, without admiring that simplicity of design in the midst of the most diversified results which every where characterizes the works of God. Every part of the vegetable fabric may be ultimately traced to one elementary organic form, of which the leaf is the type. The lamina, or blade, in various stages of transition, constitutes the several organs of fructification, while the united bases of all the leaves constitute the axis itself.

27. When we more minutely examine the internal organization of plants, we find their different parts, however various in appearance, all constructed of the same materials. The leaf, for example, consists of a *foot-stalk* prolonged into a *framework of veins*, a *fleshy substance* filling up the interstices, and a *cuticle*, or skin, covering the whole. Now this framework is composed of *woody fibre*, *aqueducts*, and *air-vessels*, all of which may be traced through the foot-stalk into the stem, where they equally exist, — this part of the leaf being only a prolongation of the stem. The fleshy substance is of the same nature with the pith of the stem, or the pulp of the fruit; and, finally, the cuticle corresponds exactly to the thin covering of the newly formed branches, of the various parts of the flower, and even of the roots.

a. These several kinds of structure, of which the various organs are composed, are called the *elementary tissues.* They are five in number; — *cellular tissue*, *woody tissue*, *vasiform tissue*, *vascular tissue*, and *laticiferous tissue.*

28. The *chemical basis* of the vegetable tissues is proved by

analysis to be oxygen, hydrogen, and carbon, with an occasional addition of nitrogen, the same simple elements as, by their varied combinations, constitute the air, water, and most animal substances. The *organic basis* is simple *membrane* and *fibre.* Of one, or both, of these two forms, all the tissues are constructed.

a. If the fleshy portion of the leaf above mentioned, or the pulp of the fruit be closely examined, they will be found composed of numerous vesicles of extreme minuteness, adhering together. These vesicles, or bladders, consist of a delicate *membrane* enclosing a fluid, such as is seen on a large scale in the pulp of an orange. Now this membrane, composing the walls of the cells or vesicles, is one of the *elementary* forms of vegetable tissue. Again, if the stalk of a strawberry or geranium leaf be cut *around* but *not through*, and the two parts be thus pulled asunder for a short space, a number of glistening *fibres* will be seen running from one portion to the other. Under a microscope these appear to be spiral coils, partially straitened by being thus drawn out from the membranous tubes in which they were lying coiled up. Thus are we able to distinguish the elementary *membrane* and *fibre*, of which the various forms of vegetable tissue are composed.

29. CELLULAR TISSUE is so called, from its being composed of separate cells, or vesicles, adhering together. This kind of tissue is the most common, no plant being without it, and many being entirely composed of it. The form of the little cells which compose it, appears to be, at first globular or egg-shaped, but afterwards, being flattened at their sides, by their mutual pressure, they become cubical, as in the pith, or twelve-sided, the cross-section being six-sided; each cell assuming a form more or less regular, according to the degree of pressure exerted upon it by those adjacent. It is also called PARENCHYMA.

a. The cuttings of the pith of elder, or those of any kind of wood, will, under a microscope, exhibit irregular cells and partitions, resembling those of a honeycomb. (Fig. 1, *a.*)

b. The vesicles of cellular tissue have no visible communications with each other, but transmit their fluids by invisible pores.

c. Cellular tissue is transparent and colorless in itself, but exhibits the brilliant hues of the corolla, or the rich green of the leaf, from the coloring matter contained within the cells.

d. The vesicles of this tissue are extremely variable in size. They are usually about $\frac{1}{300}$ of an inch in diameter, but are found of all sizes, from $\frac{1}{30}$ to $\frac{1}{3000}$ of an inch.

e. Although this tissue is usually soft and spongy, it sometimes acquires considerable hardness by the deposition of *solid* instead of fluid matter in the cells.

This occurs in the prickles of the rose, the stones of the plum, peach, &c., and in the albumen of seeds.

f. In some plants, as in the Turkey rhubarb, &c., little bundles of crystals called *raphides* (from Rafn, the name of the discoverer,) are formed in the cells.

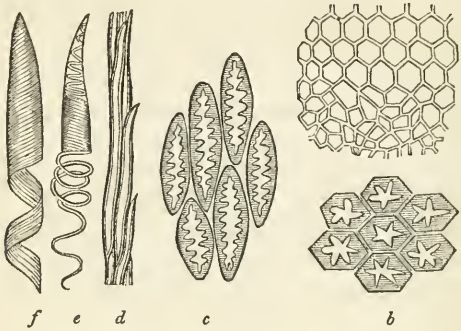

FIG. 1.—Forms of tissue; *a*, cutting of elder pith—cellular; *b*, cells from the gritty centre of the pear; *c*, from the stone of the plum—both strengthened by solid matter; *d*, woody fibre; *e*, spiral vessel with a single fibre partly drawn out; *f*, vessel with a quadruple fibre.

30. Woody tissue, called also fibre, consists of slender, transparent, membranous tubes, tapering to a point each way, and adhering together by their sides, the end of one tube extending beyond that of another, so as to form continuous threads. It differs from cellular tissue, in the greater strength, and, at the same time, the greater tenuity, of its membrane. It seems designed for the transmission of fluid, as well as for giving firmness to those parts which need support. (Fig. 1, *d.*)

a. Tissue of this form constitutes the fibre of flax, hemp, &c., the ligneous substance of the stems and roots, the petioles, and veins of leaves, &c.

31. The most remarkable modification of the woody fibre, is that called *glandular.* It consists of little glandular points, arranged along the walls of the woody tubes. It occurs only in resinous wood, chiefly of the fir tribe (*Coniferæ*). It has frequently been detected by the microscope, in fragments of fossil coal, whence it is inferred that coal-beds originated from buried forests of the Coniferæ.

32. Vasiform tissue consists of large tubes, called *dotted ducts,* having numerous little pits, sunk in the thickness of its

lining. When viewed by transmitted light, it appears as if riddled full of holes.

a. It is of two kinds; 1st, *articulated*, having its tubes interrupted by joints and partitions, as in the oak, vine, and in the monocotyledonous stems; 2d, *continuous*, without joints or partitions; often found in the roots of plants.

b. These are the largest vessels in the vegetable fabric; and their open mouths are particularly discernible in the cuttings of the oak, cane, &c. It is through these that the sap arises to the stem, and is conveyed to the leaves.

33. VASCULAR TISSUE consists essentially of *spiral vessels*, with their modifications.

a. The true *spiral vessel* much resembles the woody fibre in form, being a long, slender tube, tapering each way, but is thinner and weaker. Its peculiar mark is an elastic, spiral fibre, coiled up within it, from end to end.

b. The spiral thread is usually single, sometimes double, triple, &c. In the Chinese pitcher plant, it is quadruple. (Fig. 1, *f.*)

c. In size, spiral vessels are variable. Generally their diameter is about $\frac{1}{1000}$ of an inch; often not more than $\frac{1}{3000}$.

d. The situation of spiral vessels is in the medullary sheath, that is, just around the pith; also in every part which originates from it, such as the veins of leaves, petals, and other modifications of leaves, and especially in the petioles, from which it may be uncoiled, in the manner above described. (28, *a.*)

e. In their perfect state they contain air, which they transmit, in some way, from one to another.

f. Ducts are membranous tubes, with conical or rounded extremities, their sides being marked with transverse bars, rings, or coils, incapable of being unrolled without breaking.

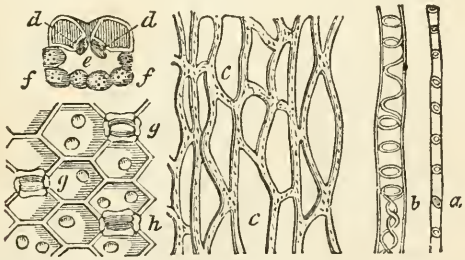

FIG. 2.—Forms of tissue, &c.; *a*, annular ducts; *b*, spiral and annular at intervals; *c*, laticiferous tissue; *e*, stomata of iris—vertical section, *d*, *d*, green cells at the orifice; *f*, *f*, cells of the parenchyma, *e*, air-chamber; *g*, *g*, view of epidermis and stomata of yucca, *h*, stomata closed; small, luminous bodies in the cells.

g. In this modification of spiral vessels the tube is much lengthened, and the coil within it is either *closed*, that is, will not unroll, as in the ferns; or it is *annular*, that is, broken into distinct rings, as in the garden balsam; or it is *reticulated*, that is, branching, the branches crossing so as to form a net-work. The office of all these ducts is the same, — that of conveying fluid. It is only in the spiral vessel that we find air. (Fig. 2, *a*, *b*.)

34. LATICIFEROUS TISSUE is so called, from *latex*, the true nutritious sap, which it is destined to elaborate and convey. It consists of branched anastomosing (ανα, to and fro, στομα, a passage) tubes, lying chiefly in the bark, and the under side of leaves. (Fig. 2, *c*.)

a. These tubes are very irregular in form, direction, and position. They expand and contract at intervals, cross and recross the other tissues, and, proceeding from the inner parts, ramify upon the outer surface, and upon the hairs, forming meshes of inconceivable fineness. Their average diameter is about $\frac{1}{1400}$ of an inch. They are largest in plants which have a milky latex, or juice.

35. The EPIDERMIS, or skin, is a form of cellular tissue externally enveloping the plant. It is found upon every part exposed to the air, except the stigma of the flower, and the spongioles of the roots. *These* it does not cover, nor is it found upon those parts which habitually live under water. And, where the bark of the stem is rugged with seams and furrows, this organ is not distinguishable.

36. It consists of a tissue of flattened cells of various figures, filled with air. Usually there is but one layer of cells, but sometimes there are two or three, especially in tropical plants. The Oleander has four. Its office, in the economy of the plant, is, to check the evaporation of its moisture.

a. The delicate membrane, which may be easily stripped off from the leaf of the house-leek or the garden iris, is the epidermis. It is transparent, colorless, and, under the microscope, reveals its cellular structure.

37. The epidermis does not entirely exclude the tissues beneath it from the external air, but is perforated by certain apertures, called STOMATA (mouths), which open or close under the influence of the light. (Fig. 2.)

38. Stomata are usually of an oval form, bounded by a pair of kidney-shaped cells, containing a green matter. Sometimes they are round, and bounded by several cells. Many other varieties of form have been noticed

39. Stomata are always placed over, and communicate with, the *intercellular passages*, that is, the spaces between the cells of the tissue. They are never found on the midrib, or veins, of the leaf, or over any ligneous part of the structure. They are most abundant over the soft, green tissue of the leaves, young shoots, and the parts of the flower.

a. These organs are of a size so minute, that more than 100,000 of them have been counted within the space of a square inch. The largest known are about $\frac{1}{500}$ of an inch in length. Their function is intimately connected with *respiration.*

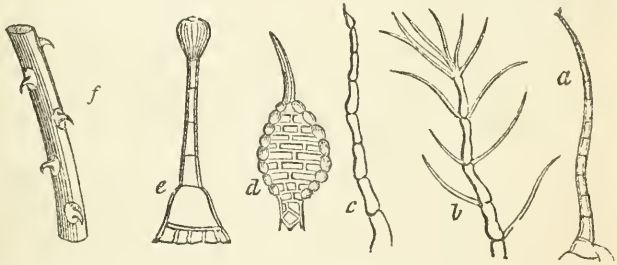

FIG. 3. — Hairs and glands; *a*, *c*, simple hairs; *b*, branched hair of the mullein; *d*, gland surmounted by a hair; *e*, gland at the top of a hair; *f*, prickles of the rose.

40. The surface of the epidermis is either *smooth*, or furnished with numerous processes, originating from itself, or from the cellular substance beneath it. These are of several classes, namely, *glands, hairs, prickles, stings,* &c.

41. Hairs are minute expansions of the epidermis, consisting each of a single lengthened cell, or of a row of cells, placed end to end, containing air. They are *simple* or *branched.* (Fig. 3.)

a. Hairs are occasionally found upon the leaves, stem, and indeed upon any other part. In the cotton plant (Gossypium) they envelope the seed. They give various names to the surface, to which they are appended, according to their nature and appearance; thus it is said to be *downy*, or *pubescent*, when clothed with soft, short hairs; — *hirsute*, with longer hairs; — *rough*, with short, stiff hairs; — *tomentose*, when they are entangled and matted; *arachnoid*, when like cobwebs; — *sericeous*, when silky; — *velvety*, when they are short, soft, and dense; — *ciliate*, when long and fringed, like the eyelash.

42. Stings are tubular and acute hairs, fixed upon minute glands in the cuticle, which secrete an acrid fluid. By the

slightest pressure this fluid is injected through the tube into the wound made by its point. Ex. nettle.

43. PRICKLES (Fig. 3) are also expansions of the epidermis, consisting of hardened cellular tissue (29, *e*). They are appended to the cuticle alone, and are stripped off with it. Unlike the *thorn* (171), they have no connection with the wood, nor do they disappear by cultivation. Ex. rose, bramble. (Rubus.)

44. GLANDS (Fig. 3) are minute bodies of cellular tissue, situated on various parts of the plant, generally serving to elaborate and discharge its peculiar secretions, which are oily, resinous, saccharine, acrid, &c.

a. They are either sessile, as in the cassia; or mounted upon a stipe, as in the passion flower; or imbedded in the leaf, causing it to appear *punctate*, as in the leaf of the lemon. Often the gland appears to be merely the expansion of a hair, either at its base or its summit. Such are called *glandular hairs.*

45. Analogous to glands, are those cavities formed in the cellular tissue, to serve as *receptacles of secretion.* Examples are seen in the rind of the orange and lemon, containing minute drops of a fragrant volatile oil. The turpentine of the fir balsam is stored up in large reservoirs of this kind.

CHAPTER III.

PRIMARY DIVISIONS OF THE VEGETABLE KINGDOM.

46. THE vegetable kingdom has long been considered by botanists under two great natural divisions, namely, PHÆNOGAMIA, or FLOWERING PLANTS, and CRYPTOGAMIA, or FLOWERLESS PLANTS.

47. Besides the obvious distinction made by the presence or the absence of the flower, these divisions are further distinguished by their structure. The Phænogamia abound with the *ligneous* and *vascular tissue*, while the Cryptogamia consist almost wholly of the *cellular*. Hence, the former are also called VASCULARES, and the latter CELLULARES.

48. Again, the former are distinguished for producing seeds composed of determinate parts, as *cotyledons* (§125) and embryo, while the latter produce certain minute bodies, called *spores*, having no such distinction of parts. Thus the Phænogamia are also called COTYLEDONOUS and the Cryptogamia ACOTYLEDONOUS plants.

49. Lastly, we find in the Phænogamia, a system of compound organs, such as root, stem, leaf, and flower, successively developed on a determinate plan (§18 – 26), while in the Cryptogamia, a gradual departure from this plan commences, and they become simple expansions of cellular tissue, without symmetry or proportion.

a. In the following pages we shall first direct our attention exclusively to the compound organs of FLOWERING PLANTS; and since, in our descriptions of these organs, frequent references will be made to particular species and genera, for illustrations and examples, it seems proper to subjoin, in this place, a brief notice of these fundamental divisions also.

50. A SPECIES embraces all such individuals as may have originated from a common stock. Such individuals bear an essential resemblance to each other, as well as to their common parent, in all their parts.

a. Thus the white clover, (*Trifolium repens*) is a *species*, embracing thousands of contemporary individuals, scattered over our hills and plains, all of a common descent, and producing other individuals of their own kind from their seed. The innumerable multitudes of individual plants which clothe the earth, are, so far as known, comprehended in about 80,000 species.

51. To this law of resemblance in plants of a common origin, there are some apparent exceptions. Individuals from the same parent often bear flowers differing in color, or fruit differing in flavor, or leaves differing in form. Such differences are called VARIETIES. They are never permanent, but exhibit a constant tendency to revert to their original type.

a. Varieties occur chiefly in cultivated species, as the apple, potatoe, tulip, Geranium, &c., occasioned by the different circumstances of soil, climate, and culture, to which they are subjected. But they continue distinct only until left to multiply spontaneously from seed, in their own proper soil.

52 A GENUS is an assemblage of species, with more points of agreement than of difference, and more closely resembling each other than they resemble any species of other groups.

a. For example, the genus *Trifolium* includes the species *T. repens*, *T. pratense*, &c., agreeing in structure and aspect so obviously, that the most hasty observer would notice their relationship. Also in the genus *Pinus*, no one would hesitate to include the white pine and the pitch pine (*P. strobus* and *P. rigida*), any more than he would fail to observe their differences.

b. Thus, the whole vegetable kingdom is, by the most obvious characters, distributed into *species*, and the species, by truly natural affinities, grouped into *genera*. These divisions constitute the basis of all the systems of classification in use, whether by natural or artificial methods.

*** To the admirer of nature, flowers are among the first subjects of attention, as mere objects of taste. They are conspicuous for their superior beauty, even in the vegetable kingdom, where all is beautiful. Yet, as objects of science, they merit a still higher regard, whether we consider the Creative skill displayed in their construction, or their important agency in the reproduction of the plant. But, to the practical botanist, an intimate knowledge of their organic structure is one of his *first* requisites, on account of the indispensable use of the floral organs in classification.

CHAPTER IV.

THE FLOWER.

§1. OF ITS PARTS, AND THEIR ARRANGEMENT.

53. A FLOWER may consist of the following members:—1. The FLORAL ENVELOPES, called, collectively, the PERIANTH, (περι, around, ανθος, a flower); 2. The STAMENS; 3. The PISTILS; and, 4. The RECEPTACLE, or TORUS.

a. Of these, only the stamens and pistils are regarded in science as essential parts. These, together with the receptacle, are said to constitute a *perfect flower*, even when one or all other parts are wanting; because these two organs alone are sufficient for the perfection of the seed. In a popular sense, however, a perfect flower must possess *all* the organs above mentioned.

b. If the stamens or the pistils, either or both, be wanting, the flower is said to be *imperfect*. An imperfect flower is either *sterile*, having stamens only, or *fertile*, having pistils only, or *neutral*, having neither organs complete.

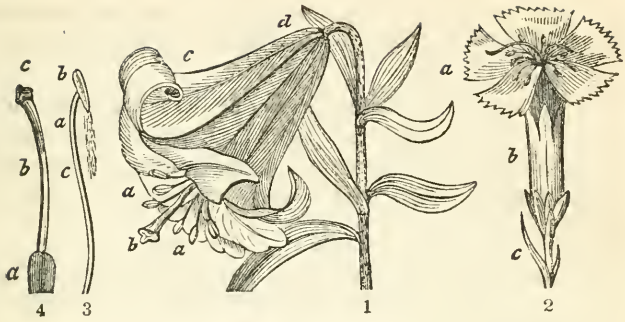

FIG. 4.—No. 1, Lily (Lilium Japonicum); 2, pink (Dianthus); 3, a stamen; 4, a pistil.

54. The FLORAL ENVELOPES, or PERIANTH, consist of one or more circles or *whorls* of leaves, surrounding the stamens. The outer of these whorls is called the *calyx*, and the other, if there be any, the *corolla*. The calyx may, therefore, exist without the corolla, but the corolla cannot exist without the calyx. If neither of them exist, the flower is said to be naked, or *achlamydeous* (α, privative, and χλαμυς, a cloak).

55. The CALYX (καλυξ, a cup), therefore, is the external envelope, the *cup*, of the flower, consisting of a whorl of leaves, with their edges distinct or united, usually green, but sometimes highly colored. The calyx-leaves are called SEPALS.

56. The COROLLA (Lat. *corolla*, diminutive of *corona*, crown) is the interior envelope of the flower, consisting of one or more circles of leaves, either distinct, or united by their edges, usually of some other color than green, and of a more delicate structure than the calyx. Its leaves are called PETALS

57. The STAMENS are those thread-like organs, situated just within the perianth and around the pistils. Their number varies from one to a hundred, but the most common number is five. Their office is, the fertilization of the seed. They are collectively called the *andrœcium* (ανδρες,* stamens, οικος, a house).

* The plural of ανηρ, a man, a term applied to the stamen, by Linnæus, in accordance with his favorite theory of the sexes of plants. The term γυνη, woman, is, on the same grounds, applied to the pistil.

58. The PISTILS occupy the centre of the flower. They are sometimes numerous, but often only one. They are destined to bear the seed. Collectively, they are called *gynœcium* (γυνη, pistil, οικος, a house).

59. The RECEPTACLE is the *summit* of the flower-stalk, out of which the floral organs grow, and upon which they stand in concentric whorls, the *gynœcium* in the centre, the *andrœcium* encircling it, the *corolla* next without, and the *calyx* embracing the whole.

60. The principal parts of the flower are shown in the cuts (Figs. 4, 6, 7, &c.), or better by *specimens, with which, both here and throughout the work, the student should always be provided.*

The slender, thread-like organs seen at *a* (Fig. 4, No. 1), are the stamens, surrounding the pistil *b*; *c* is the perianth, consisting of two similar whorls, the outer one a calyx of three sepals, the inner a corolla of three petals, surrounding or enveloping the stamens and pistil; at *d* is the receptacle. At *a* (No. 2) is the inner envelope, the corolla; at *b* is the outer envelope, the calyx or cup, which seems to contain the rest of the flower like a *cup*; at *c*, below the calyx, are certain leafy appendages called *bracteoles* or bracts.

a. Let the pupil compare specimens of these and other flowers, whose parts are well developed, until he becomes familiar with the appearance of each organ, and can instantly apply its name.

61. A complete and regular flower, therefore, is made up of four sets of organs, arranged in concentric whorls. In regard to the *number* and *position* of the individual organs composing these whorls, it is important to observe,

a. First, that each set consists, *theoretically*, of the same number of organs, that is, if the sepals be 5, there should be 5 petals, 5 stamens, and 5 pistils; or, if 3 sepals, there should be 3 petals, 3 stamens, and 3 pistils, &c.

b. Secondly, the position of the organs in each set alternates with those of each adjacent set, that is, the sepals alternate with the petals, the petals with the stamens, and the stamens with the pistils.

c. Thus, in a word, the normal structure of the truly symmetrical flower, divested of all irregularities, consists of four concentric whorls of organs, the organs of each whorl being equal in number, and alternate in position with those of the other whorls (Fig. 5; 1). This structural arrangement, as will hereafter be seen, exactly coincides with that of the *leafy branch*, agreeably to the beautiful

theory of the 'transformation of the leaves into the floral organs,'* to which allusion has already been made (§ 25). When the bud is developed into a branch, instead of a flower, the leaves are usually arranged in a simple spiral line. This spire may be broken up into equal circles or whorls, from causes to be hereafter explained. In either case the leaves of one spire, or circle, do not issue from the stem at points exactly over the *leaves* of the next circle below, but over the *intervals* between them.

62. This simple normal structure of the flower is, however, subject to many apparent exceptions, so that few, comparatively, are found perfectly conformable to it. Of these few the order Linaceæ affords good examples. In the flax (Linum) the flower is built upon the normal plan, consisting of 5 sepals, 5 petals, 5 stamens, and 5 pistils (each with 5 double carpels), all alternating with each other, according to the diagram (Fig. 5; 1).

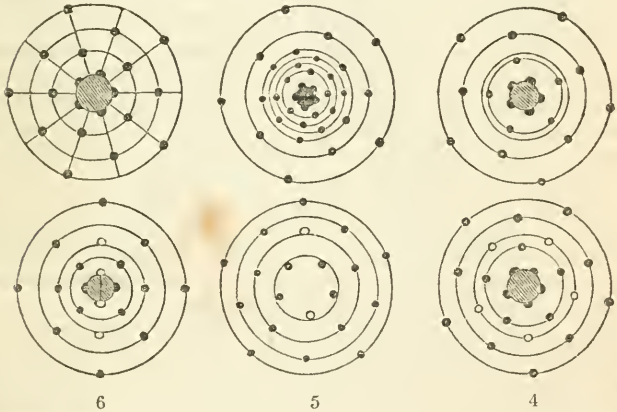

FIG. 5.—Plan of flowers; 1, of a regular and symmetrical flower, as the flax (Linum); 2, of the cherry, showing the four whorls of stamens; 3, of the primrose, showing the position of the suppressed row of stamens; 4, of the Samolus, showing the position of the 5 abortive stamens; 5, of a labiate flower, as the hemp-nettle (Galeopsis), where one stamen and one carpel is wanting; 6, of a cruciform flower, as mustard, where the stamens are in two whorls, two of those in the outer whorl and two carpels being suppressed.

63. If, with this adopted standard, we compare the numerous

* This theory was first suggested by Linnæus, the founder of Systematic Botany, and subsequently by Wolff and Goethe. After having been long unheeded by botanists, it has at length been revived by modern writers of the highest merit, and shown to be perfectly coincident with facts. 'The adoption of this theory, accordingly, has given a new aspect to botany, and rendered it one of the most philosophical and inductive of the natural sciences.' See Gray's Bot. Text-Book, Chap. VIII, where this theory is clearly stated, and richly illustrated.

forms of floral structure which occur, we shall be able to trace out the features of the general plan, even among the widest deviations, and to learn the nature and causes of these deviations. Some of them are the following.

a. One or more additional whorls of the same organ may have been developed. For example, the flower of the Trillium, which, as in most liliaceous plants, is trimerous (τρεις, three, and μερος, part) in its parts, has 6 stamens, evidently in two whorls, and in the flower of the cherry (No. 2,) there are 20 stamens, which may be regarded as arranged in four whorls of fives. Other illustrations will occur to the student.

b. Some of the entire whorls may have been suppressed. For example, in the primrose there are 5 sepals, 5 petals, and 5 stamens, but the stamens are placed opposite the petals. This is to be attributed to the absence of an intermediate whorl of stamens, for in the Samolus, a plant of the same natural order, there is a circle of sterile filaments in the place of the absent stamens (Fig. 5; 3, 4).

c. Some of the parts of a whorl may have been suppressed. Such deficiencies are very common. In the sage, for example, and Monarda, three of the stamens are wanting, in place of which are two rudimentary filaments, and the third rudiment makes its appearance in some allied genera. In most of the Labiatæ but one stamen is wanting (Fig. 5; 5). In the carrot, caraway, and all the Umbelliferæ, the pistils are reduced from 5, the normal number, to 2.

d. The parts of the same whorl may have been united. Thus the sepals may be united at their edges in different degrees, as in the phlox, pink, &c. Or the petals may be thus united, as in the morning glory: or the stamens, as in the mallows tribe; or the pistils, which is extremely common. In short, scarcely a flower can be found in which some of these cohesions do not occur.

e. The organs of different whorls may have been conjoined, causing great disturbances in the symmetry of the flower. The calyx often, as in the currant, coheres with the whole surface of the ovarium (97), only becoming *free* at the summit, so that it seems to stand upon it. It is then said (but improperly) to be superior. Again, the stamens adhere to the petals in their lower part, so as to appear to grow out of them; they are then said (improperly) to be *inserted* into the corolla. In the Orchis tribe the stamens are consolidated with the pistil. The term *free* is used in opposition to these adhesions, just as the term *distinct* is used in opposition to the cohesion of the same organs with each other.

f. The organs of the same whorl may have been unequally developed. This is the case in the corollas of the pea and bean tribes, called papilionaceous (Lat. *papilio*, a butterfly), and in those of the mint tribe called labiate (Lat. *labium*, a lip).

g. Again, *organs of one kind may have been reconverted into those of another kind, or into leaves.* Such monstrosities are of frequent occurrence among cultivated plants, and may be regarded as proofs of the present doctrine of the floral structure. In all double flowers, as the rose, peony, tulip, &c., the stamens have been reconverted into petals. By still further changes, all parts of the flower tend towards a leafy character, rendering the resemblance of the flower to an undevel-

oped branch very obvious. Nay, in some cases, the whole flower-bud, after having given a slight indication of a floral character, is transformed into a leafy branch, showing that all parts of the flower are formed out of the same elements as the leaves.

h. Sometimes the flower-stalk is not effectually checked in its growth by the development of the flower, but is prolonged *through* it, and produces secondary flowers in the midst of the organs of the first. This is not unfrequent in the rose. Several instances of these malformations are exhibited below. (Fig. 6.)

k. This mode of studying the floral structure is deeply interesting and instructive, but our limits will not permit us to dwell upon it, nor is it necessary. The intelligent student will be able to extend the above illustrations by an examination of almost any flower, with reference to its deviations from the normal plan.

FIG. 6. — 1, From Lindley, — a flower of white clover, reverting to a leafy branch; 2, here drawn from a living specimen, — a tulip, *b*, a leaf arising from the peduncle, takes the position, form, and color (in part) of a sepal; 3, here drawn from a living specimen, — a rose (R. damascena) with the axis prolonged into secondary rose-buds.

⁂ In our detailed description of the flower, we shall commence with those organs which are deemed *essential*, their mysterious agency being indispensable to the perfection of the seed.

CHAPTER V.

THE FLOWER.

§2. OF THE STAMENS, AND THE ARTIFICIAL CLASSES.

64. The stamens and pistils are situated within the floral envelopes, and since one or both are always present, in every species, at least, of the Phænogamous plants, they were seized upon by Linnæus* as the basis of his beautiful arrangement, called the Artificial System.

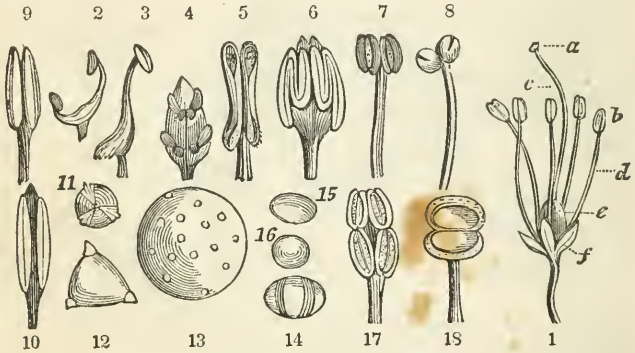

FIG. 7.—Forms of stamens, anthers, pollen, &c. 1. Stamens and pistil of a flower (Rhododendron Lapponicum), in their natural position; *a*, stigma, *b*, anthers, *c*, style, *d*, filaments, *e*, ovary, *f*, calyx and receptacle; 2, stamen of ginger; 3, sage; 4, Berberis; 5, Vaccinium amœnum, with the terminal pores; 6, cucumber, with the sinuous lobes of the anther; 7, Polygonum; 8, Lemna, anther bursting vertically; 9, lily; 10 Magnolia; 17, a four-celled anther; 18, anther of Alchemilla, bursting transversely. Nos. 11, 12, 13, 14, 15, 16, various (magnified) forms of pollen-grains.

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* Carl Von Linné, or Linnæus, the most eminent of naturalists, was the son of a clergyman, born in 1707, at Rhœshult, in the province of Smaland, Sweden. In his 24th year, while a member of the University of Upsal, he conceived the idea of that system of plants which bears his name. In 1741 he became professor of medicine in the same University, and in 1761, on account of his great literary attainments, was elevated to the rank of nobility. He died in 1778. To him the natural sciences are under incalculable obligations, all of which he classified and arranged anew. But the science of botany, especially, is indebted to him for those discoveries and classifications, which have, more than any others, contributed to its general diffusion. In his 'immortal work,' *Species Plantarum*, he enriched the language of botany by a new nomenclature of species, and many new terms in the technology of plants, for their more accurate description.

65. The STAMENS are those thread-like organs, seen in the midst of the flower, situated around the pistils and within the corolla, or the calyx, constituting the andrœcium.

66. The stamen (Fig. 4, No. 3) consists of three distinct parts; namely, the *filament*, *a;* the *anther*, *b;* and the *pollen*, *c*. The filament is sometimes wanting, the two latter are essential.

67. The FILAMENT (Lat. *filum*, a thread) is the stem, supporting the anther at or near its top, and is analogous to the stem of a leaf, or to the claw of a petal. When it is wanting, the anther, like a leaf or a petal in a similar case, is said to be *sessile*.

68. The ANTHER is generally situated at the summit of the filament, and is composed of two parallel lobes or cells, connected to each other and to the filament by the *connectile*. It is analogous to the blade of the leaf, each half blade being transformed into a lobe, and the midrib into the connectile.

a. Each cell of the anther usually opens by a longitudinal fissure, called the *dehiscence*, but sometimes, as in the potato, Pyrola, &c. by an aperture (pore) at the summit. In the Polygala, mallow, &c. the *two cells* are reduced to *one*.

b. The *connectile* is usually a mere prolongation of the filament terminating, not at the base, but at the summit of the anthers. In some cases it is prolonged above them, into a sort of appendage, as in the violet, silk-weed, &c.

c. The anther is sometimes wanting, and the filament in such cases cannot constitute a stamen, but is said to be *abortive*, or *sterile*.

69. In regard to the modes of attachment between the anther and the filament, we find the following variations; the anthers are said to be,

1. *Innate*, when they are attached to the filament by the base of the connectile.

2. *Adnate*, when they are attached to the filament by their back, so as to appear lateral; as in the Anemone, water-lily.

3. *Versatile*, when fixed by a single point to the connectile, from which they lightly swing; as in the grasses.

4. When the anthers are attached to the *inside* of the filament, or connectile, so that the line of dehiscence faces the pistils, they are called *introrse* (turned inward). But when they are attached to the outside of the connectile, so that the dehiscence faces the petals, they are called *extrorse* (turned outward). Examples of the former are seen in the violet; of the latter in the larkspur. These distinctions are of importance, as will hereafter be seen.

70. The POLLEN is, in appearance, a small, yellow dust, contained in the cells of the anther. When viewed with a microscope, it appears to consist of grains (granules) of various forms,

usually spherical, but in some plants cubical, in others triangular, in others still, polygonal, &c., always being of the same form in the same species. (Fig. 7.)

a. Each grain of pollen has been ascertained to consist of a membranous sack containing a fluid. In this fluid are suspended molecules of inconceivable minuteness, possessed of a tremulous motion. When the membrane is exposed to moisture, it swells and bursts, discharging its contents. (Fig. 12.)

71. *Physiological structure.* The filament consists of a bundle of delicate ligneous tissue, with spiral vessels, surrounded by cellular tissue, the same tissues which compose the stem of the leaf (260). The same tissues have also been traced into the connectile. The anther consists almost wholly of cellular tissue, corresponding to the fleshy substance (parenchyma) of the leaf. The pollen consists of disintegrated bladders of the same tissue.

72. *Theoretical structure.* Thus it is evident, as we have already seen, that however much the stamen may differ in aspect from a leaf, they both have the same original plan. This is further evident, from the gradual transition of stamens into petals, as seen in the water-lily or the double rose. In the former, the process is so gradual that the outer whorls exactly resemble petals, except in having the tops developed into yellow anthers, while in the rose we find organs in every conceivable state of transition from stamens to petals. That the petals are modified leaves, will hereafter be more definitely shown (106).

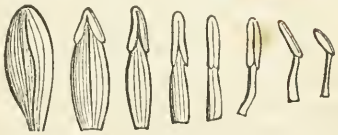

FIG. 8. — Stamens of the water-lily gradually passing into petals.

73. The stamens vary in the different kinds of plants, in respect to their *number*, *position*, *relative length*, *connection*, and *presence*. Upon these five different conditions of the stamens, the TWENTY-FOUR ARTIFICIAL CLASSES of Linnæus are founded.

74. 1st. *Number.* The first eleven classes are founded upon the *number* of the stamens — the stamens being also *free* (63, *c.*), and of *equal length.* Their names are derived from the Greek numerals combined with ανδρες (57, note), as follows: —

Class I, MONANDRIA (μονος, solitary,) includes all genera (52) of plants with one stamen to each flower.

Class II, DIANDRIA (δις, twice), with two stamens to each flower.

III, TRIANDRIA (τρις, thrice), with three stamens.

IV, TETRANDRIA (τετρα, four times), with four stamens.

V, PENTANDRIA (πεντε, five), with five stamens.

VI, HEXANDRIA (ἑξ, six), with six stamens.

VII, HEPTANDRIA (ἑπτα, seven), with seven stamens.

VIII, OCTANDRIA (οκτω, eight), with eight stamens.

IX, ENNEANDRIA (εννεα, nine), with nine stamens.

X, DECANDRIA (δεκα, ten), with ten stamens.

XI, DODECANDRIA (δωδεκα, twelve), with twelve stamens.

2d. *Position.* The next two classes depend upon the position of the stamens, — the stamens being free and equal.

XII, ICOSANDRIA (εικοσι, twenty), includes those genera of plants which have twenty or more stamens to the flower, seated on the calyx (perigynous).

XIII, POLYANDRIA (πολυς, many), twenty or more stamens, seated on the receptacle (hypogynous).

3d. *Relative length.* The two following classes are founded upon the relative length of the stamens, together with their number.

XIV, DIDYNAMIA (δις, twice, δυω, two, νημα, a filament), includes plants with four stamens, of which two are long, and two are short.

XV, TETRADYNAMIA (τετρα, four times, δυω, νημα), with six stamens, of which four are long, and two are short.

4th. *Connection.* The five succeeding classes depend upon the connection of the stamens, in various ways.

XVI, MONADELPHIA (μονος, αδελφος, a brother), includes plants with the filaments united into one set or fraternity.

XVII, DIADELPHIA (δυω, αδελφος), into two sets or fraternities.

XVIII, POLYADELPHIA (πολυς, αδελφος), into many sets or fraternities.

XIX, SYNGENESIA, (συν, together, γενεσις, origin), stamens united by their anthers, into a tube.

XX, GYNANDRIA (γυνη, § 57, note, ανηρ), stamens consolidated with the style.

5th. *Absence.* The four remaining classes depend upon the *absence* of the stamens in a part or all of the flowers of the same species.

XXI, Monœcia (μονος, οικος, an abode), includes plants where the stamens and pistils are in separate flowers, on the same individual.

XXII, Diœcia (δις, οικος), in separate flowers on different individuals.

XXIII, Polygamia (πολυς, many, γαμος, marriage), where the stamens and pistils are separate in some flowers, and united in others, either on the same or two or three different plants.

XXIV, Cryptogamia (κρυπτος, concealed, γαμος), includes those genera of plants where the stamens and pistils are wanting, or at least invisible, commonly called Flowerless Plants. (46—49.)

a. Such are the twenty-four Linnean classes, in which all the genera of the vegetable kingdom are included. Nothing could have been more simple than the first eleven. To distinguish them, we have only to *count* the stamens. The other classes are founded upon distinctions less simple, though in general easy to be understood. A good specimen flower of each class should here be closely examined, to illustrate the definitions, and fix them in the memory.

The following simple figures are emblematic of each class, to which the pupil is required to apply the appropriate numbers and names.

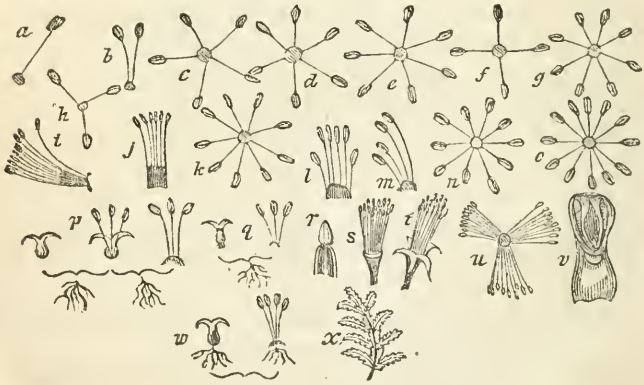

FIG. 9. — Stamens.

CHAPTER VI.

THE FLOWER.

§3. OF THE PISTIL, AND THE ARTIFICIAL ORDERS.

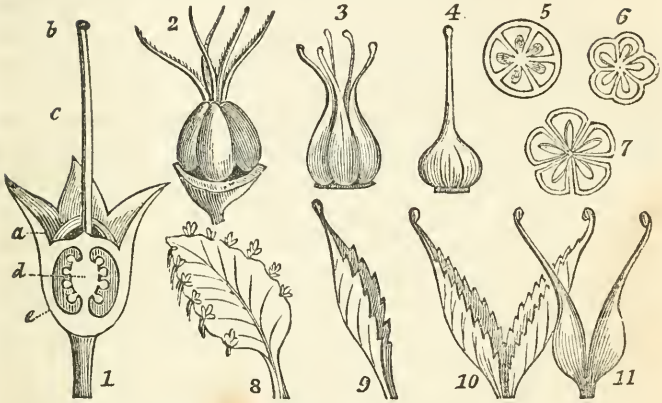

FIG. 10.—1, Pistil of a whortleberry (Vaccinium amœnum); *b*, the stigma; *c*, style, *a*, the epigynous disk; *e*, perpendicular section of the ovary combined with the adherent (superior) calyx; *d*, the placenta with the ovules; 2, the gynœcium of a flower with 5 pistils, showing the carpels and styles distinct; 7, cross section of the same; 3, the carpels united and the styles distinct; 6, cross section of the same; 4, both carpels and styles united; 5, cross section of the same; 8, leaf of Bryophyllum, putting forth buds from its margin; 9, carpel of the garden cherry, reverting to the form of the leaf; 10, two such carpels; 11, two perfect carpels.

75. The pistil (or pistils) occupies the centre of the flower, at the termination of the axis. It consists of three parts, the *ovary*, or germ, *a*, (Fig. 4.) the *style*, *b*, and the *stigma*, *c*. The style is sometimes wanting, and the stigma then becomes *sessile* upon the ovary. (See also Figs. 10, 11.)

76. The ovary (Lat. *ovarium*, a depository, from *ovum*, an egg) is the tumid and hollow part of the pistil, situated at its base, containing the *ovules*, or young seeds within its cavities, and destined to become the fruit.

77. The ovary is either simple or compound. When compound, it consists of two or more lobes or divisions, called carpels (*καρπος*, fruit), united together more or less closely.

Sometimes these divisions are very evident, being but slightly connected, while in other cases, all external marks of them disappear. When simple, it of course consists of a single carpel. (Fig. 10.)

78. The STYLE is that prolonged columnar part of the ovary, or rather of each carpel, which bears the stigma at its top. The number of the styles, when they are not wanting, always equals the number of carpels: but when the carpels are closely united, the styles may be united also, into a single compound column, or they may even then remain distinct.

79. The STIGMA is the upper portion, or extremity, of the style, extremely various in form, but usually globular. Like the ovary and style, it is either simple or compound. When it is compound it consists of as many united lobes as there are carpels.

80. The number of distinct styles (or of stigmas, when the styles are wanting) constitutes the basis of the artificial orders, into which the first thirteen classes of Linnæus are subdivided. They are named from the Greek numerals prefixed to the termination *gynia*, (γυνη, 57, Note,) as follows.

Order 1. Monogynia, includes all the genera of plants in either of the first thirteen classes, with one style to the flower.
2. Digynia, with two styles to the flower.
3. Trigynia, with three styles.
4. Tetragynia, with four styles.
5. Pentagynia, with five styles.
6. Hexagynia, with six styles.
7. Heptagynia, with seven styles.
8. Octogynia, with eight styles.
9. Enneagynia, with nine styles.
10. Decagynia, with ten styles.
11. Dodecagynia, with eleven or twelve styles.
12. Polygynia, with more than twelve styles.*

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* The orders of the remaining classes are founded upon characters not depending upon the pistil, and are as follows:—

The orders of class 14, Didynamia, are only two;

1. Gymnospermia, with seeds apparently naked.
2. Angiospermia, with seeds evidently in a seed-vessel, or pericarp.

81. The OVULES are certain little globular bodies, produced in the cells of the ovary, destined to become the seeds in the matured fruit. (Fig. 10; 1.)

82. The PLACENTA is that part of the ovary from which the ovules arise, and to which they are attached. It consists of a line, or fleshy ridge, placed in some angle of the cell. Its direction is always vertical, that is, parallel with the axis of growth. (Fig. 10; 1, *d.*)

83. *Physiological structure.* The ovary and style are composed chiefly of one or more bundles of vascular tissue, imbedded in cellular tissue. The stigma consists of a loose cellular substance, called the conducting tissue, communicating with the placenta through the centre of the style. It is the only part of the ascending axis which is destitute of the *epidermis* (35).

84. *Theoretical structure.* The pistil, as before stated (25, *a*), is the modification of a leaf, or of a whorl of leaves, each leaf constituting a carpel. Each carpel has its own style and stigma, and is formed of a leaf folded together in such a way that the upper surface becomes the inner, and is turned towards the

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The 15th class, Tetradynamia, is divided into two orders, which are distinguished by the form of the pod:—

1. Siliculosa, the fruit a silicle, or short pod.
2. Siliquosa, fruit a silique, or more or less elongated pod.

The orders of the 16th, 17th, 18th, 20th, 21st, and 22d classes are of the same name and character as the first 13 classes themselves, that is, they are founded upon the number of the stamens to the flower, thus:—

Order 1, Monandria, includes all Monadelphous plants, Diadelphous plants, &c. with one stamen to each flower.

2, Diandria, with two stamens to each flower, and so on.

The orders of the 19th class, Syngenesia, are five:—

Order 1. Equalis (equal), with the florets (flowers) of the head all perfect.

2. Superflua (superfluous), florets of the rays, or margin of the head pistillate, the rest perfect.
3. Frustranea (frustrated), florets of the margin neutral, the rest perfect.
4. Necessaria (necessary), florets of the margin pistillate and fertile, the rest staminate and sterile.
5. Segregata (separated), each floret having its own proper calyx.

The orders of class 23d, Polygamia, are two, founded upon the same characters as the two preceding classes:—

1. Monœcia, where both separated and perfect flowers are found in the same individual.
2. Diœcia, where the different flowers occupy different individuals.

The orders of class 24th, Cryptogamia, are nine, the same as the natural orders of this grand division, as *Filices*, the ferns, *Musci*, the mosses, &c

axis, while the lower surface becomes the outer. By this arrangement the two edges of the carpel often appear like *sutures* (Lat. *sutura*, a seam), of which the outer, formed by the midrib, is called the *dorsal*, and the inner, formed by the united margins, the *ventral*.

a. This view of the pistil is remarkably confirmed and illustrated by the flowers of the double cherry, where the pistil may be seen in every degree of transition, reverting towards the form of the leaf. This *carpellary leaf* (Fig. 10; 9) stands in the place of the pistil, having the edges infolded towards each other, the midrib greatly prolonged, and a little dilated at the apex.

b. If this be compared with the pistil of the cherry, seen in the figure, no doubt can be entertained that the two sides of the leaf correspond to the walls of the ovary, the margins to the ventral suture, the prolonged midrib to the dorsal suture, and the style and the dilated summit to the stigma. Sometimes the flower contains two such leaves, which always present their concave faces towards each other, as seen in the figure. This corresponds with the position of the true carpels, in which the ventral sutures of each are contiguous.

c. Many other plants, as the rose, Anemone, Ranunculus, &c. exhibit similar transformations of the pistil, so that there can be no doubt that the carpel is formed upon the same plan in all plants. '*The ovary, therefore, is the blade of a leaf, the style the lengthened midrib, and the stigma the dilated and denuded apex of the same.*'

85. From this doctrine of the structure of the single carpel, the student will be able and expected to demonstrate many propositions like the following.

a. First. A compound ovary consists of a whorl of carpellary leaves, their united edges all meeting in the centre, and the cohering sides forming a kind of radiation from it (Fig. 9).

b. Second. There must be as many cells as there are carpels.

c. Third. The partitions between the cells, that is, the dissepiments (*dissepio*, to separate,) must each be double; they must be vertical; they must be equal in number to the carpels, and *alternate* with the stigma.

d. Again, the single carpel can have no true dissepiment. If any ever occur, it is regarded as an anomaly, and called *spurious*. Ex. flax (Fig. 11).

86. These propositions are true only when each carpellary leaf appears in its normal condition, that is, with its two edges mutually united. But cases occur where only the margins of adjacent leaves are united (Fig. 11; 1, 2, 3). In this case there will be no dissepiments, and the compound ovary will, of course, become one-celled. Ex. pea.

87. The placentæ are developed at each of the two edges of the carpellary leaf. If these edges be in their normal conditions, that is, united, there will be apparently but one placenta to the carpel, and that central. But if the edges be separate, there will necessarily be two placentæ to each carpel, the one to the right and the other to the left of the dorsal suture and style. They are then said to be parietal (*paries*, a wall).

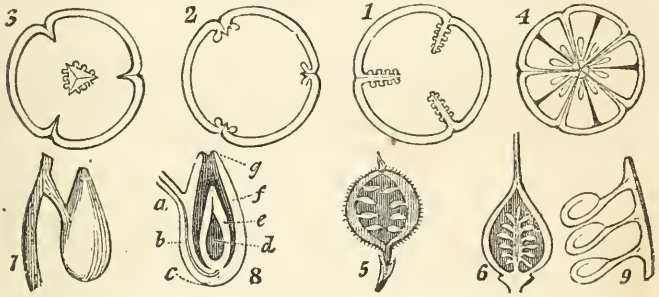

FIG. 11.—1, Cross section of a one-celled, three-carpelled ovary with parietal placentæ, the dissepiments partially obliterated; 2, dissepiments wholly obliterated; 3, dissepiments obliterated, showing a free central placenta; 4, a five-celled ovary with 5 false dissepiments, as in the flax; 5, vertical section of an ovary with parietal placentæ; 6, with free central placentæ; 7, an amphitropous ovule; 8, vertical section of the same; *a*, funiculus; *b*, raphe; *c*, chalaza; *d*, nucleus; *e*, secundine; *f*, primine; *g*, micropyle; 9, anatropous ovules attached to the ovary.

88. But the placentæ are sometimes found in the *common centre* when there are *no dissepiments* (Fig. 11; 3, 6). This anomaly, which is called a *free central placenta*, is thus explained. The dissepiments were at first actually formed in the usual manner, but afterwards, by the rapid expansion of the shell, they were torn away and obliterated.

a. As the ovules are always developed by the placentæ, they, of course, grow out of the margins of the carpellary leaf, and are, therefore, understood to be analogous to buds. For, in the Bryophyllum, and some other plants, the true leaves do habitually develop buds at their margins (Fig. 10; 8), and in the mignionette the ovules themselves have been seen transformed into leaves.

89. The ovules are almost always enclosed in the ovary. In the mignionette they are partially naked, and in the fir tribe, Coniferæ, are entirely naked, there being no carpellary leaf.

a. The ovule is said to be *erect* when it grows from the base of the ovary; *ascending*, when it grows from a little above the base; *pendulous*, when it hangs from the summit of the cavity, and *suspended*, when it hangs from a little below the summit.

90. In their early state, the ovules are quite soft, consisting of two sacks or integuments, containing a pulpy mass, and open only at their apex, where there is a passage left through both, called the *foramen*. The outer integument is called the *primine*, the other the *secundine*, and the central pulpy mass the *nucleus*. (Fig. 11; 8.)

a. The foramen may be detected even in the perfect seed, by soaking it in water, and then pressing out the fluid thus absorbed, which will be seen to issue from this little orifice. It has an important agency in the fertilization of the seed, which at this early period has no traces of the embryo (18).

91. The stalk by which the ovule is connected to the placenta, is called the *funiculus*, and its point of attachment to the nucleus of the ovule, the *chalaza*. Through these the ovule receives its nourishment from the placenta. (Fig. 11; 8, 9.)

§4. OF THE MUTUAL ACTION OF THE STAMENS AND PISTILS.

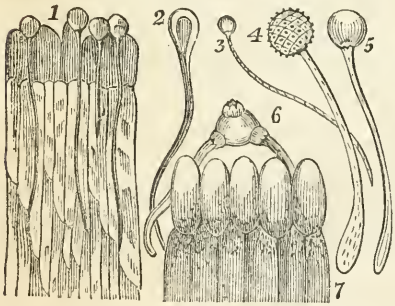

FIG. 12.—1, Section of the upper part of the style of the snap-dragon, the pollen tubes passing down between the cells; 2, 3, 4, 5, various forms of pollen, showing the tubes; 6, pollen of the Œnothera biennis, one of its tubes descending among the cells of the style.

92. The specific use of the stamens and pistils is the fertilization of the seed (57, 58). This appears to be effected in the following manner. At the proper season, the anthers discharge the pollen contained in their cavities, through their dehiscence or pores, into the air. Some of it thus falls upon the stigma.

a. The Author of nature makes special provision for the accomplishment of this function. Thus the anthers are generally placed above the stigma, the stamens being *longer* than the pistils when the flower is erect, as in the tulip, and *shorter*, when it droops, as in several species of the lily. In the mountain

laurel (Kalmia), the anthers are confined in ten cavities in the corolla; at the proper season they are disengaged, and thrown forcibly against the stigma, by the elasticity of the filaments. In Monœcious and Diœcious plants, where the stamens are placed apart from the pistils in different flowers, the pollen is often conveyed to the pistil by insects in going from flower to flower in search of honey.

93. Soon after the pollen falls ~~from~~ on the stigma, the outer coat of each granule bursts (69, *a*) at one or more points, allowing the inner coat to pass through it in the form of a tube. This tube insinuates itself between the cells of the stigma, and passes down between the loose cells of the style, extending itself until it reaches the ovary, even when the style is of considerable length. When these tubes reach the ovary, they direct themselves towards the ovules in different parts, and enter the foramen, which at this time is turned towards the base of the style, and brought in contact with its conducting tissue (83).

94. The molecules which the pollen grains contained (69, *a*) are seen to pass down the tubes, and some of them are conveyed into each ovule. Whilst yet within the tube, they are seen to develop themselves into new cells, and these becoming fixed in their places constitute the *embryo*, or the rudiment of the future plant.

CHAPTER VII.

THE FLOWER.

§ 5. OF THE CALYX.

95. The term *calyx* comes from the Greek, and signifies a *cup*. It is applied to the outer whorl of the floral envelopes, in reference to its common form and position. It is generally green, but is sometimes *colored*, that is, it is of some other color than green. It seems designed for the protection of the more delicate organs of the flower in æstivation (in the bud).

96. The divisions of the calyx are called *sepals*, which are

sometimes distinct, but generally cohere by their edges, to a greater or less extent, forming a cup as in the rose, or a tube as in the pink. The calyx is then said to be *monosepalous*, a term which must never be *literally* applied, since no true calyx can consist of merely a single sepal; when the sepals are not united in any degree, the calyx is said to be *polysepalous*.

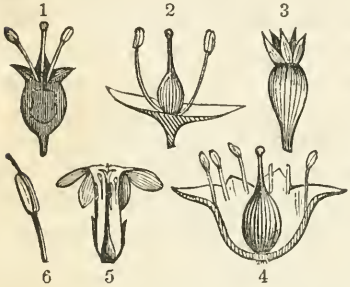

FIG. 13.—3, Ovary, with adherent (superior), persistent calyx; 1, vertical section of the same, showing the epigynous (Gr. *upon the pistil*) stamens; 2, calyx free (inferior), stamens hypogynous (Gr. *under the pistil*); 4, stamens on the calyx, that is, perigynous (Gr. *around the pistil*); 5, stamens on the corolla (perigynous); 6, stamen with the connectile continued beyond the anther.

97. If the calyx is *free*, that is, distinct from the ovary, as in the pink, it is said to be *inferior*, while the ovary is superior; but if the calyx be *adherent* to the sides of the ovary, so as to appear to grow out of its summit, as in the rose, it is said to be *superior*. (Fig. 13; 1, 3.)

98. In respect to duration, it is *caducous* when it falls off as soon as the flower is expanded, Ex. poppy; *deciduous*, when it falls off as the flower decays, Ex. water lily; and *persistent*, when it remains upon the germ after the corolla has fallen; Ex. rose, apple.

99. The calyx is sometimes reduced to a mere rim, and sometimes, when there is no corolla, the calyx is entirely wanting (54).

a. Again, the calyx is reduced to a whorl of mere hair-like processes, called *pappus*, or down. This kind of calyx is peculiar to the Compositæ, as the Asters, sunflower, &c., where the flowers are collected in heads so compact that the calyx has no room to develop itself in the usual manner. If the pappus consists of simple hairs, it is said to be *pilose;* if the hairs are feathery, *plumose;* if they are stiff, like bristles, *setose;* if dilated, so as to become chaffy, *paleaceous*.

§6. OF THE COROLLA.

100. *Corolla* is a Latin diminutive, signifying a chaplet or

crown. It is fitly applied to that whorl of the floral envelopes situated between the calyx and the stamens, upon the delicate texture and hues of which chiefly depend the beauty of the flower.

101. The divisions of the corolla are called petals. Like the sepals of the calyx, they are either distinct, or united by their adjacent edges to a greater or less extent, as in the morning glory. When they are distinct, the corolla is said to be *polypetalous;* otherwise, *monopetalous*, a term which is as greatly misapplied in this case as *monosepalous* is to the calyx, since no true corolla can consist simply of a single petal.

102. A petal consists of two parts; the *claw*, which is the narrow part at the base, answering to the stalk of a leaf, and the *lamina*, which is the expanded portion supported by the claw, and answers to the blade of the leaf. The claw is sometimes very long, as in the pink, and often is wanting, as in the rose.

103. When the petals are confluent into a monopetalous corolla, the united claws form that part of it which is called the *tube*, and the lamina constitute the upper, expanded portion of it, which is called the *limb* or border. Both of these parts are exhibited in the Phlox.

104. Monopetalous corollas are *regular* when all the parts correspond to each other in shape, size, and cohesion; and *irregular* when they do not. Both these kinds assume various forms (Fig. 14), which have received appropriate names, as follows:

1. *Campanulate* (bell-shaped), having the tube wide, and swelling abruptly at the base, as in the bell-flower (Campanula).

2. *Infundibuliform* (funnel-form), tubular at the base, but gradually enlarging towards the border. Ex. morning glory, tobacco.

3. *Hypocrateriform* (salver-form), the tube ending abruptly in a border spreading horizontally. Ex. Phlox.

4. *Rotate* (wheel-form), limb regular, or nearly so, spreading, with a very short or imperceptible tube. Ex. mullein.

5. *Labiate* (lipped). This corolla has its limb deeply cleft

into two irregular segments, called the upper and lower lip. If the lips be widely separate, they are said to be *ringent* (*ringo*, to grin). Ex. monkey-flower. If the upper and lower sides are pressed together, *personate* (*persona*, a mask); Ex. snap dragon. If the upper lip is arched, it is termed the *helmet* or *galea*. Ex. Lamium. This form of the corolla almost universally characterizes the plants of the large and important natural order Labiatæ.

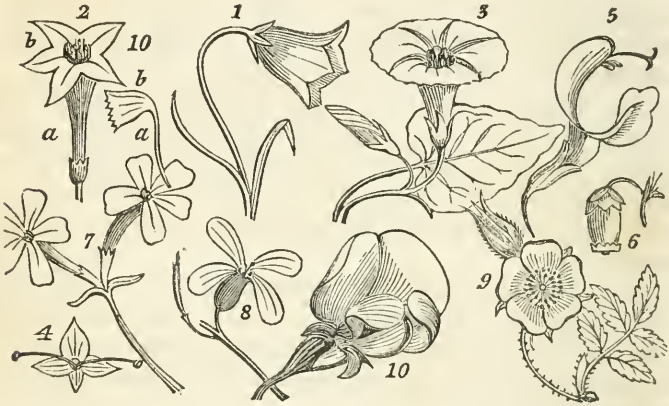

FIG. 14.—Forms of corollas; 1, Campanula rotundifolia; 2, tobacco; 3, Convolvulus; 4, Veronica; 5, sage; 6, Gaultheria procumbens; 7, Phlox; 8, cabbage; 9, rose; 10, Lathyrus.

105. Several forms of polypetalous corollas have also received appropriate names, and are described as follows. The last only is irregular.

1. Cruciform (*crux*, a cross), consisting of four petals spreading at right angles to each other. Plants with this corolla constitute the large natural order Cruciferæ, which corresponds to the 15th class in the artificial arrangement. Of this kind is the mustard (Sinapis).

2. *Rosaceous*, like the rose. A regular corolla, consisting of five or more petals, spreading horizontally, attached to the receptacle by very short claws. Ex. rose, apple.

3. *Liliaceous*, like the lily. The Perianth consists of six parts, each gradually bending outwards in such a manner as to resemble the campanulate. Ex. lily, tulip (Fig. 4).

4. *Caryophyllaceous*, like the pink. This corolla consists of five petals, having long claws immersed in a tubular calyx. Ex. pink, cockle (Fig. 4).

5. *Papilionaceous*, butterfly-shaped. This corolla consists of five dissimilar petals, which have received names as follows; — the upper and largest is called the *banner* (*vexillum*); the two lateral ones beneath this, the *wings* (*alæ*); and the two lower ones cohering by their lower margins, the *keel* (*carina*). Examples, pea, bean, locust. Plants with this kind of corolla constitute the greater part of the Leguminosæ, one of the most extensive and useful of the natural families.

106. PHYSIOLOGICAL STRUCTURE. The floral envelopes are found, in their physical organization, to agree with leaves, of which they are only modifications. They consist of thin expansions of cellular tissue, traversed by veins of delicate spiral vessels, all covered with an epidermis often having stomata. Their various colors are produced by secretions contained in the little bladders of the cellular tissue.

§ 7. OF THE NECTARY AND DISK.

107. These are terms which have been applied to certain anomalous forms of the floral organs, and are very variable in structure and position.

a. The NECTARY (*nectar*, honey) is properly an apparatus for the secretion of honey. In the violet, larkspur, columbine, &c., it consists of a prolongation of the petal into a *spur*. In the nasturtium it is a similar prolongation of the sepal. In the passion flower. grass parnassus, gold-thread, &c., the nectaries are merely abortive stamens passing into petals. In the lady's slipper and other Orchidaceous plants, the lower petal being inflated and larger than the rest of them, was called nectary by the Linnean school, but by modern writers the labellum, or lip.

b. The DISK is a term applied to certain little projections situated between the bases of the stamens and the pistils. Its more common form is that of a raised rim, either entire or variously lobed, surrounding the base of the ovary, that is, *hypogynous* (ὕπο, under, γυνη, the pistil), as in the peony, or it appears at the top of the ovary when the calyx is superior, and is then said to be *epigynous* (επι, upon, γυνη), as in the Cornus.

c. The true character of the disk is little understood. It is supposed by Lindley to consist of stamens in a rudimentary state, as it is sometimes separated into a circle of glandular bodies, alternating with the true stamens.

§8. OF ÆSTIVATION.

108. ÆSTIVATION (*æstivus*, of summer) is a term used by botanists, to denote the relative arrangement of the several organs of the flower while yet undeveloped in the bud. It is the same to the flower-bud as VERNATION (*vernus*, of the spring) is to the leaf-bud.

a. The different modes of æstivation may be best observed in sections of the bud, made by cutting it in a horizontal direction. The most common varieties are the following.

1. *Valvate;* applied to each other by the margins only; as the petals of the Umbelliferæ, the valves of a capsule, &c.

2. *Convolute;* when one is wholly rolled in another, as in the petals of the wall-flower.

3. *Quincuncial;* when the pieces are five in number, of which two are exterior, two interior, and the fifth covers the interior with one margin, and has its other margin covered by the exterior, as in Rosa.

4. *Contorted;* each piece being oblique in figure, and overlapping its neighbor by one margin, its other margin being, in like manner, overlapped by that which stands next it, as the corolla of Apocynum.

5. *Alternative;* when, the pieces being in two rows, the inner is covered by the outer in such a way that each of the exterior rows overlaps half of two of the interior, as in the Liliaceæ.

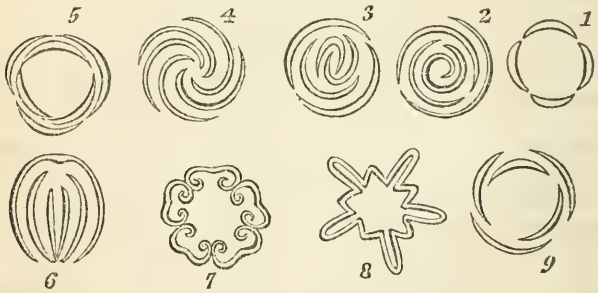

FIG. 15.—Æstivation of the corolla; 1, Hydrangea; 2, Cheiranthus; 3, Rose (single); 4, Oxalis; 5, Lilium; 6, Pisum; 7, Lysimachia; 8, Solanum; 9, calyx of the Rose. The last form, with 4 and 5, are also termed *imbricate*.

6. *Vexillary;* when one piece is much larger than the others, and is folded over them, they being arranged face to face, as in papilionaceous flowers.

7. *Induplicate;* having the margins bent abruptly inwards, and the external face of these edges applied to each other without any twisting; as in the flowers of some species of Clematis.

8. *Supervolute;* when one edge is rolled inwards, and is enveloped by the opposite edge rolled in an opposite direction; as the leaves of the apricot.

Of these forms of æstivation, the 4th, 5th, and 9th, are frequently designated by the general term *imbricate*, that is, edge overlapping edge.

CHAPTER VIII.

THE FRUIT.

109. The *fruit* appears to be the ultimate object and aim of the whole vegetable organization; accordingly, when this is perfected, the process of vegetation ceases, the foliage withers, and the whole plant, if it be an annual, soon dies. But in the *fruit*, provision is made for the reproduction of the species, so that it is justly said to be 'the termination of the old individual, and the beginning of the new.'

a. The fruit is, therefore, the most important part of the plant. Although it does not, like the flower, serve to adorn the face of nature by the beauty of its form and color, yet, besides its own peculiar office of perpetuating vegetable life, it affords one of the principal means of subsistence to animals and to man.

b. The fructification, in respect to time, is subsequent to the flower, is always preceded by it, and, as has been sufficiently shown, is dependent upon it for its maturity and perfection. After having imbibed the pollen from the anthers, the pistil, or its ovary, continues to enlarge, and is finally matured in the form of the peculiar fruit of the plant. The *fruit* is, therefore, properly speaking, *the ovary brought to perfection.*

110. Such being the case, it follows that the fruit is constructed on the same general plan as the ovary, and its structure may be inferred with much accuracy, by the examination of the latter at the time of flowering. In many cases, however, the fruit undergoes such changes in the course of its growth from the ovary, as to disguise its real structure; so that an early examination would be even more safe in its results than a late one.

a. For example, the oak-acorn is a fruit with but one cell and one seed, although its ovary had three cells and six ovules. The change is produced by

the non-development of five of the ovules, while the sixth grows so rapidly as to obliterate the dissepiments and occupy the whole space. The same change also takes place in the hazle-nut. The ovary of the birch is two-celled and two-ovuled, but, by the suppression of one cell with its ovule, the fruit becomes one-celled.

§ 1. OF THE PERICARP.

111. The FRUIT consists of the *pericarp* and the *seed;* the former may be wanting, but the latter is essential.

a. Truly *naked* seeds are found in few plants, except the Coniferæ, where the pollen falls directly upon the ovules without the intervention of the pistil. The seeds of the sage and the borage, with their respective tribes, generally said to be *naked*, are not so in fact, for each seed being the product of an ovary with one ovule must necessarily be a one-seeded pericarp.

112. The PERICARP (περι, around, καρπος, fruit) is the covering or envelope of the seeds, of whatever nature it may be. It consists of three different parts. 1. The *epicarp* (επι, upon) is the outer integument, or skin. 2. The *endocarp* (ενδον, within), called also putamen or shell, is the inner coat, and the *sarcocarp* (σαρξ, flesh) is the intervening fleshy substance.

a. Thus, in the peach, the skin is the epicarp, the fleshy pulp the sarcocarp, and the shell of the stone the endocarp. In the apple or pear, the endocarp forms the glazed lining of the cells, the epicarp the epidermis, and the sarcocarp the intervening pulp.

113. The growth of the fruit depends upon the absorption of sap from the parts below. This fluid, finding no *growing axis* to be prolonged in the usual manner into a branch, is accumulated in the pistil and adjacent parts, is condensed by evaporation, and elaborated into cellular matter by the external surfaces, which still perform the functions of true leaves. Thus these parts become gradually distended into the form and dimensions of the fruit.

114. The process of ripening consists of certain chemical changes, effected by the combined action of heat, light, and air. In its earliest stages, the pericarp consists of a structure similar to that of leaves, being composed of cellular and ligneous tissue, with an epidermis and stomata (35, 37).

a. Secondly, the fleshy pulp, or sarcocarp, is developed, and becomes sour by absorbing from the air an excess of oxygen, which is the proper acidifying principle.

b. Lastly, when the fruit has attained its full growth, the pulp becomes gradually sweetened and softened, by the formation of sugar at the expense of the acids and of the ligneous matter, which before rendered it both sour and hard. These transitions are exemplified by the apple, plum, currant, &c., where the greater portion of nutritive matter is stored up in the pericarp; but in the fruit of

the oak, chestnut, some of the grasses, &c., it is chiefly or entirely deposited in the seed.

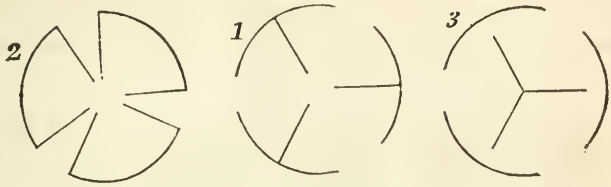

FIG. 16.—Modes of dehiscence; 1, Locu.icidal; 2, Septicidal; 3, Septifragal. The straight lines represent the dissepiments.

115. *Dehiscence.* When the pericarp has arrived at maturity, it either remains permanently closed (indehiscent) as the acorn, or it separates into parts forming openings. These parts are called *valves*, and these openings, the *dehiscence*. Regular dehiscence is always vertical, and is called,

1. *Loculicidal* (*loculus*, a cell, *cædo*, to cut), when it takes place by the opening of the dorsal suture of each carpel directly into the cell. Ex. lily.

2. *Septicidal* (*septum*, a wall, and *cædo*), when it takes place through the dissepiments (which are doubled, § 85, *c*). Ex. mallows.

3. *Septifragal* (*septum*, and *frango*, to break), when the valves separate from the dissepiments, which remain still united in the axis. Ex. Convolvulus.

4. *Sutural* (*sutura*, a seam), when it takes place at one or both sutures, in a fruit with a simple carpel. Ex. pea.

5. An irregular dehiscence, called *circumscissile* (*circumscindo*, to cut around), occurs in the plantain, verbena, henbane, &c., where the top of the pericarp falls off like a lid. (Fig. 18; 16.)

116. The forms of the pericarp are exceedingly diversified, and have been studied by botanists with great attention. The following varieties are generally described in elementary works.

1. Capsule (a casket), is a term applied to those pericarps which are of a hard and woody texture, proceeding from a compound ovary, dehiscing at the side or top, by *valves*, or sometimes by pores only.

a. The capsule consists of only *one cell*, or is divided within

by dissepiments (85, *c*) into many cells. The central pillar, or substance formed by the united placentæ is called the *columella.* To this the seeds are generally attached. The seed-vessels of the Lobelia, mullein, pink, poppy, bloodroot (Sanguinaria), are capsules.

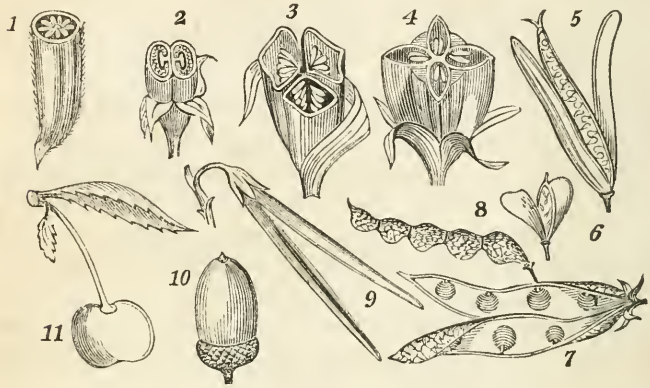

FIG. 17.— Forms of fruit: 1, capsule of Rhododendron; 2, Nicotiana; 3, Colchicum; 4, Œnothera; 5, silique of Raphanus; 6, silicle of Capsella; 7, legume of the pea; 8, jointed legume (loment) of Desmodium; 9, follicle of Apocynum; 10, nut of oak; 11, drupe of Cerasus.

2. Silique (a pod). This is a long, narrow pericarp of two valves, divided into two cells, by a false dissepiment formed by the extended placentæ. The seeds are attached to the edges of this dissepiment, alternating with its opposite sides. Ex. mustard, wallflower, and other Cruciferæ.

3. Silicle (a little pod), differs from the silique, by being shorter, and more nearly oval. Ex. pepper-grass, shepherd's purse (Thlaspi). The silique and silicle are peculiar to plants with cruciform corollas.

4. Legume (also a pod), consists of two valves, but has no dissepiments, and thus differs essentially from the silique. It bears its seeds attached to the margin of each valve alternately, along the ventral suture only. Ex. pea, and all other plants of the great natural order Leguminosæ. The legume, therefore, accompanies the papilionaceous corolla.

5. Follicle (a bag) is a pericarp with one valve and one

cell, opening by a sutural dehiscence on the inner side, and bearing seeds at the base, or along the suture. Ex. peony, columbine, silk-weed.

6. Drupe (stone-fruit) is one-celled, one or two seeded, indehiscent, with a hard and bony *endocarp* (stone), and a moist and pulpy *epicarp* and *sarcocarp*. Ex. plum, cherry, peach. It also includes those fruits which have a fibro-fleshy, or even coriaceous epicarp, as the walnut, butternut, which kinds of fruit are called *drupaceous*.

7. The Nut is a hard, dry, indehiscent shell, proceeding from an ovary which is two or more celled, and two or more ovuled, but becoming by suppression one-celled, and one-ovuled (110, *a*). It differs from the Drupe, in wanting the soft, succulent covering. Instead of this it is seated in a kind of persistent involucre, called a cupule. Ex. chestnut, oak, beech, hazle.

8. Caryopsis (kernel). This is a thin, dry, one-celled pericarp, inseparable from the seed which it encloses. Ex. maize, wheat, Carex. When it is not inseparable from the seed, it is called a *utricle*, as in the pig-weed (Chenopodium).

9. An achenium is a small, dry, hard, one-celled pericarp, distinct from the seed which it contains. Ex. Borago, Ranunculus, Aster, and the Compositæ generally.

10. Samara (winged fruit). It consists of a dry, indehiscent, one-seeded pericarp, with a wing-like appendage. Ex. birch, maple.

11. A pyxis (box) is a capsule which opens by a circumsessile dehiscence (115; 5), so as to appear like a little cup with a lid. Ex. plantain (Plantago), purslane (Portulaca).

12. Pome (apple). This is a fleshy, indehiscent pericarp, formed of the permanent calyx, containing several cartilaginous carpels, or cells, which enclose the seeds. Ex. apple, pear, quince.

13. The pepo (gourd) is an indehiscent, fleshy fruit, proceeding from a compound ovary, either one-celled, or entirely filled with pulp. Ex. cucumber, melon, pumpkin.

14. *Berry* (*Bacca*), a succulent, pulpy pericarp, holding the seeds loosely within, with no other covering than its own soft

mass. Ex. currant, whortleberry. The orange and lemon answer this definition, and are therefore berries.

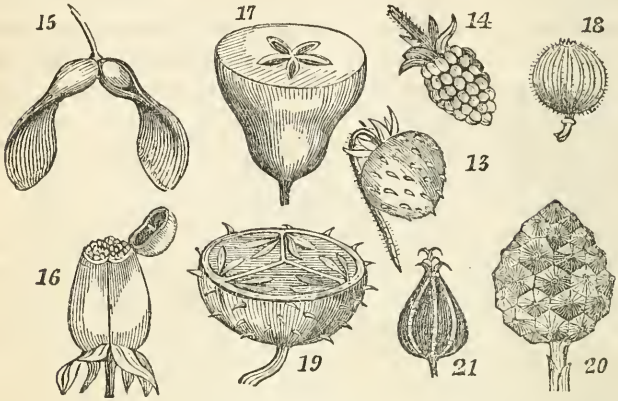

FIG. 18.—Forms of fruit; 13, naked achenia of Fragaria on the surface of the enlarged, fleshy receptacle; 14, drupaceous achenia of a Rubus on a fleshy, deciduous receptacle; 15, samara of Acer; 16, pyxis of Hyoscyamus; 17, pome of Pyrus (pear); 18, berry of Ribes (gooseberry); 19, section of the same enlarged; 20, strobile of Pinus; 21, cremocarp of the Umbelliferæ, as Conium.

a. This definition cannot include the strawberry, which consists of an enlarged, fleshy receptacle, bearing numerous achenia upon its surface. Nor does it include the blackberry, which, like the other species of the Rubus, is an aggregate fruit composed of united drupes. These fruits are called Etæria, by Mirbel. (Fig. 18; 13, 14.)

15. Strobile (cone). This is an aggregate fruit, consisting of scale-like carpels spread open, with naked seeds on their inner side, at base. Such is the fruit of the fir tribe, which is on this account called Coniferæ.

CHAPTER IX.

THE FRUIT.

§2. OF THE SEED.

117. The seed is the ultimate product of vegetation, and contains the rudiments of a new plant, similar in all respects to the original.

a. The seed consists of three principal parts; — the INTEGUMENTS, the ALBUMEN, and the EMBRYO.

118. The INTEGUMENTS, or coverings, invest the seed immediately exterior to all its other parts. Although apparently single, they consist of several membranes, to each of which an appropriate name has been applied. The first, or outer membrane, is the TESTA; the second, the MESOSPERM; the third, the ENDOPLEURA, corresponding with the primine, &c. (90) of the ovule.

a. The testa is either papery (membranous), leathery (coriaceous), horny (crustaceous), bony, fleshy, or woody. Its surface is generally smooth, sometimes beautifully polished, as in the Indian shot (Canna), or columbine, and often highly colored, as in varieties of the bean, &c. It is sometimes expanded into wings, as in the Arabis, and sometimes into a tuft of hairs at one end, called *coma*, as in the silk-weed, or it is entirely enveloped in hairs, as in the cotton.

b. The *coma* must not be confounded with the *pappus* (99, *a*), which is a modification of the calyx, appended to the pericarp, and not to the seed, as in the *achenia* of the thistle, dandelion, and other Compositæ.

119. The *aril* is an expansion, proceeding from the summit of the funiculus, or seed-stalk (91), (or from the placenta when the funiculus is wanting) either partially or wholly investing the seed. A fine example is seen in that gashed covering of the nutmeg, called mace. In the celastrus it completely envelops the seed. In other seeds it is a mere scale, and often it is wanting.

120. The HILUM, or *scar*, is that point or mark left on the coats of the seed, by its separation from the funiculus (stalk). It is commonly called the *eye*, as in the bean, pea, maize, &c. (Fig. 11; 8, *a*.)

121. The hilum of the seed sometimes corresponds with the chalaza of the

ovule. In this case the ovule, or seed, is said to be *orthotropous* (erect), Ex. candleberry (Myrica). More generally, however, the funiculus (91) extends beyond the hilum, passing under the integuments partly around the nucleus, before it is joined to it. The point of this final juncture is always the chalaza, and that part of the funiculus which then intervenes between the hilum and the chalaza is called the raphe. This form of the ovule, or seed, is called *anatropous* (inverted), and is exemplified in the apple. The raphe can, therefore, exist only in the anatropous seed, and serves to distinguish it. (See Fig. 11; No's 8 and 9.)

122. The ALBUMEN. Next within the integuments, there is a white substance called the albumen, consisting chiefly of starch. It constitutes the chief bulk of some seeds, as maize, wheat, rye, and serves to nourish the embryo in its nascent state. It abounds chiefly in those seeds which have but one cotyledon. It is wholesome and nutritious, even in poisonous plants. The albumen in some seeds is entirely wanting, particularly in the bean, pea, &c., the nutritious matter being all absorbed in the cotyledon.

123. The EMBRYO is an organized body, the rudiments of the young plant, situated within the integuments. To the growth of this all other parts of the seed are subservient. In some seeds the embryo is distinctly visible. Ex. bean, Convolvulus.

124. The embryo is divided into three parts; the *radicle*, the *plumule*, and *cotyledon*.

a. The *radicle* is the descending part of the embryo, destined to form the root (radix). In respect to position, it always points towards the foramen.

b. The PLUMULE is the ascending part of the embryo, or the rudiment of the ascending axis of the future plant. It is usually directed towards the chalaza.

125. The COTYLEDON is the bulky, porous, and farinaceous part of seeds, destined to form the first or seminal leaves of the young plant, as well as to afford nourishment to the plumule and radicle, before they can obtain it from the earth. In the bean, squash, cucumber, and most other plants, the cotyledons are conspicuous in rising above the ground.

a. The number of cotyledons is variable; and upon this circumstance is founded the most important and distinct division of the PHÆNOGAMIA, or FLOWERING PLANTS.

126. Monocotyledonous plants are those whose seeds have but one cotyledon,

or, if two are present, one is minute or abortive. Such plants are also called ENDOGENS (ἐνδον, inside, γιγνομαι, to originate or grow), because their stems increase by internal accretions (197). Such are the grasses, the palms, the Liliaceæ, &c., whose leaves are mostly constructed with parallel veins.

127. Dicotyledonous plants are such as bear seeds with two cotyledons. These are also called EXOGENS (ἔξω, outside), because their stems increase by external accretions, including the bean tribe, the melon tribe, all our forest trees, &c. These are also distinguished at a glance, by the structure of their leaves, which are reticulate-veined, that is, with veins dividing and uniting again, like network.

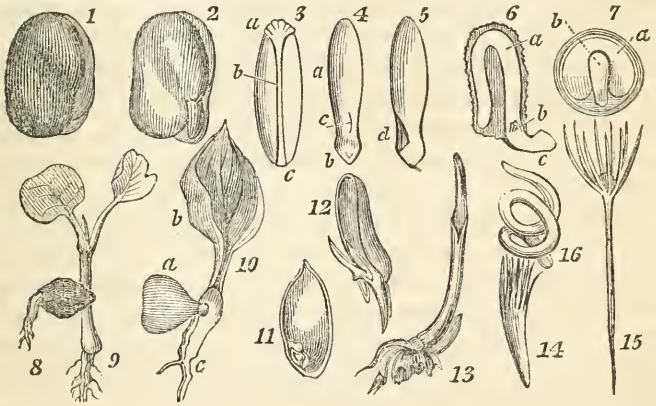

FIG. 19. — Structure of seeds and germination; 1, seed of a garden bean; 2, the same after germination is commenced and the skin thrown off; 3, seed of Triglochin (magnified); *a*, fungous chalaza, *b*, raphe, *c*, hilum; 4, embryo; *a*, cotyledon, *b*, radicle, *c*, fissure, beneath which lies the plumule; 5, vertical section of the same; *d*, the radicle seen beneath the fissure; 6, germinating seed of Alisma; *a*, cotyledon, *b*, plumule, *c*, radicle; 7, seed of Canna lutea, vertical section, *a*, albumen, *b*, embryo; 8, fruit of Mirabilis, showing the commencement of germination, the embryo protruding the radicle; 9, the same, having thrown off the pericarp and become a young plant; 10, germinating seed of Calla Æthiopica; *a*, seed, *b*, first leaf of plumule, *c*, radicle; 11, section of the fruit of a grass with the embryo at base; 12, the same after germination has commenced; 13, the germination completed, and the young plant formed; 14, embryo of Pinus, showing the numerous cotyledons; 15, the same after germination has commenced; 16, embryo of Cuscuta, having no cotyledon.

128. The pine and fir have seeds with from two to three cotyledons, while the dodder (Cuscuta) is almost the only example known of an embryo with no cotyledon.

129. A few plants, as the onion, orange, Coniferæ, &c., occasionally have two or even several embryos in a seed, while all the CRYPTOGAMIA, or flowerless plants, have no embryo at all, nor even seeds, but are reproduced from SPORES, (48) bodies analogous to the pollen grains of flowering plants.

§ 3. OF GERMINATION.

130. The embryo is the most important part of the seed. It is to the protection and nourishment of this alone, that all other parts of the seed, and even of the whole plant, are subservient, and if this be injured or destroyed, the ultimate object of the whole vegetable economy would seem to be defeated.

a. GERMINATION is a term denoting the first stages of vital action in the seed; the process is briefly described as follows:

131. When the seed is *planted* in a moist soil, at a moderate temperature, the integuments gradually absorb water, soften, and expand. The water is decomposed, its oxygen combines with the carbon of the starch which had been stored up in the tissues. Thus, losing a part of its carbon, the starch is converted into sugar for the nourishment of the embryo, which now begins to dilate and develope its parts. Soon the integuments burst, the radicle descends, seeking the damp and dark bosom of the earth, and the plumule arises, with expanding leaves, to the air and the light.* (See Fig. 19, explanations.)

132. As to the cotyledons, they either remain under ground at the centre of motion, as in all Monocotyledonous plants and in the oak, or, as in almost all Dicotyledonous plants, they arise above the surface with the ascending axis, become green, and perform the functions of digestion and respiration, like leaves, for the nourishment of the young plant.

133. The conditions requisite for the germination of the seed are heat, moisture, oxygen, and darkness.

a. Heat is a requisite condition of all vital actions, as well in the *sprouting* of a seed as in the *hatching* of an egg, and if it be not supplied from a source within,

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* The phenomena of germination, in all its stages, may be observed in an interesting experiment. Let a few seeds, as of the flax or the pea, be enveloped in a lock of cotton, floating upon water in a bulb-glass. In a few days, the plumule ascends in its genial air, while the radicle shoots downwards in long silky fibres.

The ascent of the plumule in a direction contrary to gravity is a law in vegetation, as universal as the law of attraction in matter, and no less difficult to explain. From the two following experiments, it would seem to result both from the influence of the light and the law of gravitation. Professor Shultz planted some seeds of cabbage, mustard, and beans, in moss, and so arranged them that the only light which they could receive was from a mirror, reflecting the solar rays upwards; they sent their stems downwards, and their roots upwards.

Mr. Knight placed vessels, containing earth with germinating seeds, upon the circumference of a large horizontal wheel, which was kept constantly and rapidly revolving for several days. The seeds grew, but instead of ascending perpendicularly, the axis of each plant was inclined at an angle of 45°, or more, towards the centre of the wheel, in accordance with the combined action of the centrifugal force of the wheel, and the attraction of the earth.

must be obtained from without. Different degrees of heat are required by different plants, but a temperature from 50° to 80° is most favorable to those of the temperate zones. Such is the genial warmth supplied by the sun.

b. Water is also requisite for softening the integuments, and for dissolving the dry nutriment stored up in the albumen, or the cotyledons. This is supplied in showers of rain and dew.

c. Oxygen is requisite, as seen above, for the conversion of starch into sugar; a process always depending upon the formation and evolution of carbonic acid, as well in the seed as in the laboratory of the chemist. This is supplied by the water and by the air.

d. And, finally, darkness is favorable, because it is through the influence of light, as will hereafter be shown, that plants absorb carbonic acid from the air, decompose it, retain the carbonic acid, and give back the oxygen only. Light would therefore tend to increase the quantity of carbon, rather than diminish it. Hence the seed should be *buried* in the soil.

134. The ripened seeds of most plants have the power of retaining their vitality for many years, if they are placed in circumstances which will neither cause them to germinate nor decay, such as a low or moderate temperature, with the absence of moisture. Thus the seeds of maize have been known to grow when 30 years old, rye 40 years, kidney beans 100 years, and the raspberry and beach plum after many centuries.*

§ 4. THE DISSEMINATION OF SEEDS

135. Is a subject highly curious and interesting; and when attentively considered, serves, like a thousand other cases in the works of Nature, to illustrate the wisdom and design of its great Author. By means of the coma, or pappus, already described, the seeds of the thistle, dandelion, and numerous other plants, are wafted by winds to considerable distances, across rivers, mountains, and even the ocean itself. The *Erigeron Canadense*, a weed now common on both sides the Atlantic, was supposed by Linnaeus to have been transported to Europe from Canada, of which country it is native.

a. Seeds are also furnished with wings for the same purpose. Others are provided with hooks, or beards, by which they lay hold of men or animals, and are thus scattered far and wide.

b. Some seeds, as the Impatiens, which are destitute of all such appendages, are thrown to some distance by the bursting of the elastic pericarp. Rivers, streams, and the currents of the ocean, are all means of transporting seeds from country to

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* No instance of the longevity of seeds is more remarkable than that related by Dr. Lindley. 'I have before me,' says he, 'three plants of raspberries, raised from seeds which were taken from the stomach of a man whose skeleton was found 30 feet below the surface of the earth. He had been buried with some coins of the emperor Hadrian, and it is therefore probable that the seeds were 1600 or 1700 years old.'

Several years ago, in the State of Maine, about 40 miles from the sea, some men, in digging a well, threw up some sand from a remarkable layer, about 20 feet below the surface, and placed it by itself. A year or two afterwards several shrubs sprung up from this sand, grew, produced fruit, and proved to be the beach-plum.

country. Thus, the cocoa, and the cashew-nut, and the seeds of the mahogany, have been known to perform long voyages, without injury to their vitality. Squirrels, laying up their winter stores in the earth, birds, migrating from clime to clime, and from island to island, in like manner conspire to effect the same important end.

CHAPTER X.

THE ROOT.

136. The root is the basis of the plant, and the principal source of its nourishment. It originates with the *radicle* of the seed; the tendency of its growth is downwards, and it is generally immersed in the soil.

a. When the radicle has burst the integuments of the seed, and penetrated the soil, its body becomes divided into branches, or fibres; each of these is again divided and sub-divided into fibres, often exceedingly numerous and minute, ever extending and multiplying, until the vegetable has attained its full growth.

137. The prone direction of the root is accounted for by the extreme delicacy of the fibres, which renders them averse to the air and light, by their avidity for moisture, and by the effects of gravitation.

a. Although the primary direction of the roots is downward, they are not known to extend to any great depth. After having descended to a certain distance beneath the surface, they extend themselves horizontally, keeping at about a uniform depth, however great the irregularities of the surface.

138. The number and extent of the roots must always correspond to the demands of the vegetable, both for affording it nourishment, and for maintaining it in its erect position. It follows, therefore, that for every expanding leaf, or extending twig, there must be a corresponding increment of the roots and fibres beneath the soil.

139. Roots are generally distinguished from stems by their downward direction, by the presence of absorbing fibres, by the constantly irregular arrangement of their branches, and by the absence of buds, stomata, and pith.

140. To all these characteristics there are, however, exceptions. Thus, buds, in peculiar circumstances, are developed by the roots, sending up shoots, or suckers, around the parent stem. This does not happen in the natural or healthy state of the plant, but only when the life of the upper axis is partially or wholly destroyed, the roots remaining in full vigor, and elaborating more nourishment

than there is now demand for. Such buds are, therefore, merely *adventitious*. On this account it would seem that those *roots*, commonly so called, which do naturally and uniformly produce buds, are with propriety described by modern writers as *subterranean stems;* as the *root-stalk* of the sweet flag (Calamus), the *bulb* of the tulip, or the *tuber* of the potato.

141. The summit of the root, or that part which connects it to the ascending axis, is designated as the *collum*, or neck.

a. Strictly speaking, this is the only stationary part of the plant. Occupying the centre of motion between the ascending and descending axis, every enlargement that takes place upon its upper surface arises into the air, while all below it descends into the earth.

142. The parts of the root which require especial notice, are the *caudex*, *fibrils*, and *spongioles*.

a. The CAUDEX (stock) is the main body of the root.

b. The FIBRILS are the finer branches of the root, sent off from the caudex. These are the *true roots*.

c. The SPONGIOLES are the tender and delicate extremities of the fibrils; and, since the latter lengthen only by accretions made to these extremities, these are their *growing points*.

143. The form of the root is much diversified in different plants, but the principal varieties which have received distinctive names, are the following:—

144. *Ramose* (branching). This root consists of ramifications sent off from the main root, like the branches of a tree, but in no determinate order. Such are the roots of most trees and shrubs. (Fig. 20.)

a. There is a strong analogy between the roots of a tree and its branches. In many instances they may be made to perform, each the functions of the other; that is, the tree may be *inverted*, and the branches will become roots and the roots put forth leaves like the branches. The willow and the maple may be thus inverted without injuring their vitality.

b. A branch may often be made to put forth roots instead of leaves. If a branch (offset) of the willow or currant (Ribes) be inserted into the ground, either by the lower or the upper end, or by both at once, it will take root and flourish. Other trees, as the mulberry (Morus) may be multiplied by layers. A branch is bent and inserted into the ground by the apex. When it has taken root it is severed from the parent stock, and becomes a perfect tree.

c. The roots of a tree extend in all directions, and to considerable distances. This distance is at least equal to the extent of the branches, and often much greater. Those of the elm embrace an area of 300 feet diameter, of the poplar,

400. Forest trees, being less exposed to the assaults of the wind, are much less firmly rooted than those in open situations.

145. *Fusiform* (spindle-shaped). It consists of a thick, fleshy caudex, tapering downwards, and also, for a short space, upwards. It sends off from the sides and extremity, thread-like fibrils, which are in fact its true roots, since they alone absorb nourishment from the ground. Ex. parsnip, radish.

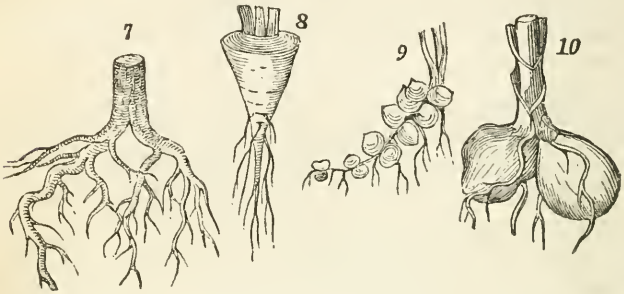

FIG. 20.—Forms of the root; 7, branching roots of a tree; 8, root of Daucus; 9, Oxalis; 10, Orchis.

a. When the fusiform root divides into two principal branches, it is said to be *forked*. When it tapers from the *collum* downwards its whole length, it is called a *conical* or *tap* root. But its most remarkable variety is the

b. Premorse, in which the caudex terminates abruptly below, as if it had been *bitten off* (præmorsus). This is due to the fact that the lower extremity perishes after the first year. Ex. Viola pedata, and Scabiosa succisa.

c. The *napiform* (turnip-shaped) root is another variety of the fusiform, where the upper portion swells out, so that the diameter is greater than the length. Ex. turnip.

146. The *fibrous* root consists of numerous thread-like divisions, sent off directly from the base without any caudex. Such are the roots of most grasses, which multiply their fibres exceedingly in a light sandy soil.

a. A *fasciculated* root is a variety of the fibrous, with some of its fibres thickened, as in the crow-foot (Ranunculus), peony, Dahlia, &c.

147. A *tuberous* root consists of one or more fleshy knobs, or

tumors, situated at the base among the fibres. Ex. Orchis. This root must be distinguished from the *tuber*, which, like the potatoe, uniformly bears buds, and is now classed among stems.

a. A *palmate* (hand-shaped) root is a variety of the tuberous, where the knob is separated below into short, thickened processes, as in some species of the Orchis.

b. A *granulated* root consists of many small tubercular knobs, connected by fibres, as seen in the common wood sorrel. Some writers call this variety *moniliform* (*monile*, a necklace).

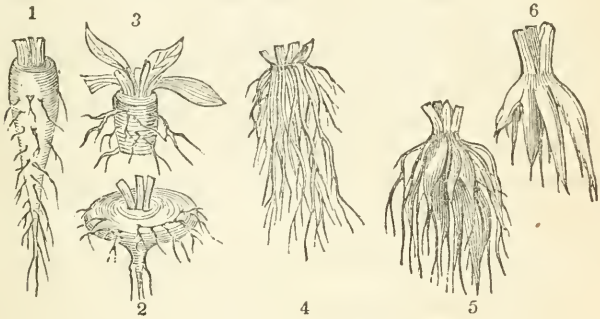

FIG. 21.—Forms of the root;—1, Raphanus; 2, Brassica rapa; 3, Scabiosa; 4, Poa; 5, Pæonia; 6, Dahlia.

148. All the above forms of fleshy roots appear to be reservoirs where the superabundant nutriment secreted by the plant, is accumulated and kept in store for the following year, or for the time of flowering.

a. To the varieties already mentioned, we may add several others, which are remarkably distinguished by their not being fixed in the soil.

149. The *floating* root is peculiar to plants which float loosely upon the surface of the water. Ex. Lemna, Callitriche. The latter, called water starwort, floats upon the surface only until flowering, after which it sinks to the bottom, fixes its roots in the mud, and there ripens its seeds.

150. *Aerial* roots are those which, instead of originating from portions of the plant beneath the surface of the ground, are produced from some portion in the open air. Of these roots, several varieties are remarkable. 1st, Those which are sent forth

from the joints of creeping or prostrate plants; as the ground-ivy, and the twin-flower (Linnæa). 2d, The roots of certain erect plants of the endogenous structure, originating from the stem high in air, descending and entering the soil. Of this class the screw-pine (Pandanus) is a remarkable example, whose aerial roots are often several feet in length before reaching the earth. Such roots, a few inches in length, are also seen in the common maize (Zea).

b. A third class of aerial roots is peculiar to the *epiphytes* (επι, upon, φυτον, a plant). These plants are fixed upon the trunk and branches of other species, and derive their nourishment chiefly from the air. Such are the long moss (Tillandsia), pendent from lofty trees, and many of the Orchidaceæ at the south. 4th, The roots of *parasites* are usually aerial. These are not only attached to other vegetables, but, penetrating their tissues, they derive nourishment from their juices. The Cuscuta and Mistletoe are examples.

PHYSICAL STRUCTURE AND FUNCTIONS OF THE ROOT.

151. The internal structure of the root is similar to that of the stem (q. v.), except that there is often a greater proportion of cellular, fleshy matter, as in the beet. In Endogens the root is endogenous, in Exogens it is exogenous, but in the latter case it is always destitute of a pith.

152. The fibrils are in fact but subdivisions of the caudex, or main root. They consist of minute bundles of vasiform tissue (32), enclosed in a loose, cellular epidermis, except at the extremities (35), where the tissue is naked and becomes exceedingly loose and spongy. These (spongioles) have the property of powerfully absorbing water.

153. The growth of the root does not take place by the expansion of the parts already formed, but simply by the addition of new matter at the extremities, and by the formation of new layers upon the surface. This accounts for the facility with which it penetrates the crevices of the soil, and forces its way into the hardest earth.

154. The most obvious function of the root is the purely mechanical one of *fixing the plant in the earth*, and maintaining

its posture. But its peculiar and most important function is ABSORPTION, or drawing from the soil that food and moisture which its growth absolutely requires.

a. Let any small growing plant be taken from the earth, and immersed by its roots in a glass of water. If it be then exposed to the light of day, or especially to the sun, the water will disappear from the glass more rapidly than could be expected from evaporation alone. A plant of spearmint has thus been found to absorb water at the rate of more than twice its own weight per day. The water thus absorbed by the roots is mostly sent off again, or *exhaled* through the leaves (a process called EXHALATION), only a small part of it, together with the salts which it held in solution, being retained for the use of the plant.

155. The activity of *absorption* must, therefore, depend upon the activity of *exhalation;* and since the latter is dependent upon the presence of light and heat, it follows that absorption will, in general, be more active by day than by night.

156. The root does not absorb moisture by its whole surface, indiscriminately, but only by the spongioles at the extremities of the fibrils, where the pores are not obstructed by the epidermis. From the spongioles it is conducted by the vasiform tissue of the fibril to the vessels of the main root, and immediately carried up the stem, and distributed to all parts of the plant.

a. If a growing radish be placed in such a position that only the fibres at the end may be immersed in water, the plant will continue to flourish. But if the root be so bent that the fibrils shall be curved up to the leaves, and only the curved body of the root be immersed, the plant will soon wither, but will soon be again revived, if the fibres be relaxed and again submerged.

b. Hence, in transplanting trees, too much care cannot be taken to preserve, uninjured, as many as possible of these tender, absorbing fibres.

157. The force with which plants absorb fluids by their roots is very great, as is proved by experiment.

a. If the stem of a vine be cut off when the sap is ascending, and a bladder be tied to the end of the standing part, it will in a few days become distended with sap, even to bursting. Dr. Hales contrived to fix a mercurial gauge to a vine thus severed, and found the upward pressure of the sap equal to 26 inches of mercury, or 13 lbs. to the square inch.

158. The causes of the absorption of fluids, by the roots, have been the subject of much inquiry. It has generally been said to be due to capillary attraction; but, unfortunately for this theory, there are no capillary tubes in the vegetable structure, but only closed cells, more or less elongated, through the membranous walls of which the fluids must force their way. There is, however, a phenomenon

in Natural Philosophy, discovered by Dutrochet, which bears so strong a resemblance to absorption in Physiology, that late writers are generally agreed in explaining the latter by the former. It is, briefly, as follows:

a. Let the broad end of a tunnel-shaped glass be firmly covered with a piece of bladder, and the cavity within be filled with a solution of gum or sugar. If now the outer surface of the bladder be immersed in water, a passage of fluid will take place through the membrane into the glass, so that the volume of the solution will be much increased, while at the same time there will be a current in the opposite direction, the solution within passing into the water without, but in a much smaller quantity. If, on the other hand, the glass be filled with water and immersed in the solution, it will be partly emptied by this action. The principal current is termed ENDOSMOSE (flowing inwards), and the other EXOSMOSE (flowing outwards).

159. From the above experiment, and others of a similar nature, it is justly inferred, that the conditions requisite for the action of these two currents are, *two fluids of different densities, separated by a porous septum*, or partition. Wherever these conditions exist, the current exists also.

a. Now these conditions exist in the root. The spongiole is the porous septum; the water around it is one of the fluids, and the other is the fluid within, rendered dense by the admixture of the descending sap elaborated by the leaves. Now if the *absorption* be the *endosmose* resulting from these conditions, there must be the counter current, the *exosmose*, also. That this is actually the case, is proved by the fact that the peculiar products of the species may always be detected in the soil about the roots of the plant, and also, that a plant grown in water, always communicates some of its peculiar properties to the fluid in which it is immersed.

160. The use of absorption in the vegetable economy is not merely the introduction of so much water into the plant, but to obtain for its growth those mineral substances held in solution by the water, which constitute an important part of its food.

a. Now in accomplishing this object, the roots seem to be endowed with a certain power of *selection* or *choice*, which has not been satisfactorily explained. Thus, if wheat be grown in the same soil with the pea, the former will select the *silex* along with the water which it absorbs, for the construction of the more solid parts of its stem; while the latter will reject the silex, and appropriate to its use the *calcareous* matter which the water holds in solution.

CHAPTER XI.

THE STEM, OR ASCENDING AXIS.

161. THAT part of the plant which originates with the plumule (124, *b*), and arises above the surface, expanding itself to the influence of the air and the light, is called the ASCENDING AXIS or STEM.

a. The cause of its upward tendency is unknown (131, note), but is supposed to be in some way due to the principles of light and gravitation.

162. Although the first direction of the stem's growth is *vertical*, there are many plants in which it does not continue so, but extends in an oblique or horizontal direction, either just above the surface of the ground, or just beneath it. When the stem continues to arise in its original direction, it is said to be *erect.* When it grows horizontally upon the surface, it is said to be *procumbent*, *creeping*, *trailing*, &c. When it arises obliquely it is an *ascending* stem, and when it continues buried beneath the soil it is a *subterranean* stem.

a. The subterranean stem, and some varieties of the creeping, have usually been described as roots.

163. In regard to duration, the stem, like the root, is said to be *annual* when it lives but one season, afterwards dying, at least down to the root, and *perennial* when its existence is continued beyond one season, to an indefinite period of time.

164. In regard to the size and duration of the stem, plants are distinguished into trees, shrubs, and herbs.

a. A TREE is a plant with a perennial, woody stem, or trunk, which does not divide into branches for a certain distance above the ground. Ex. elm, palm.

b. A SHRUB is a plant of smaller dimensions than a tree, having a perennial, woody stem, which divides into branches at or near the ground, like the alder. A shrub of diminished size is termed an *undershrub.* Ex. whortleberry.

c. An HERB is a plant with an annual or perennial root, pro-

ducing stems which, above the ground, are of annual duration only, and do not become woody. Ex. the grasses, mullein.

165. The most distinctive property of the stem is the formation and development of BUDS. At the commencement of its growth, the ascending axis is itself a bud.

166. BUDS are of two kinds, namely, the *leaf-bud*, containing the rudiments of a leafy branch, and the *flower-bud*, containing the same elements transformed into the organs of a flower, for the purposes of reproduction.

167. The leaf-bud consists of a minute, tender, *growing* point of cellular tissue, originating with the pith, surrounded and protected by a covering of imbricated scales and incipient leaves. (Fig. 22; 1.)

168. These scaly envelopes of the bud appear to be the rudimentary leaves of the preceding year, formed late in the season, arrested in their development by the frosts and scanty nutriment, and reduced to a scar and hardened state. If the bud of the maple or horse-chestnut (Æsculus) be examined, when swollen in spring, the student will notice a gradual transition from the outer *scales* to the evident *leaves* within.

a. It is an interesting illustration of designing Wisdom, that buds are furnished with scales only in wintry climates. In the torrid zone, or in hot-houses, where the temperature is equalized through the year, plants develope their buds into foliage immediately after their formation, without clothing them in scales. In annual plants, also, the buds are destitute of scales, not being destined to survive the winter. Hence it is evident that the transformation of autumnal leaves into scales, is a means ordained by the great Author of nature, to protect the young shoots, in their incipient stages, from cold and moisture,—an office which they effectually fulfil by their numerous downy folds, and their insoluble coat of resin.*

169. The original bud (plumule) of the embryo is at first developed into a *simple* stem, and being itself continually reproduced, is always borne at the termination of that stem; that is, *the axis is always terminated by a bud.*

a. Besides this, the axis produces a bud (21, *a*) in the axil of each leaf, that is, at the point just above the origin of the leaf-stalk. If these axillary buds remain inactive, the stem will still be *simple*, as in the mullein. In general, however,

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* In many trees the scales of the buds are clothed with a thick down. In others, as in the horse-chestnut, balm of Gilead, and other species of poplar, the buds are covered with a viscid and aromatic resin, resembling a coat of varnish. A considerable quantity may be separated from a handful of such buds in boiling water.

some or all of them are developed, forming leafy divisions of the axis, which thus becomes *branched.*

b. Buds are said to be *adventitious* when they are neither terminal nor axillary. Such buds generally result from some unnatural condition of the plant, as maiming or disease, and may be formed in the internodes, or upon the roots (140), or from the trunk, or even from the leaves, as in the Bryophyllum.

170. A BRANCH, therefore, is a division of the axis, produced by the development of an axillary bud.

171. A THORN, or spine, is a leafless, hardened, pointed, woody process, with which some plants are armed, as if for self-defence. Ex. Cratægus, locust.

a. The thorn appears to be an abortive growth of a bud, resulting from the imperfect development of the *growing point* only, while its leafy coverings perish. Some plants which naturally produce thorns become thornless by cultivation. In such cases the buds are enabled, by better tillage, to produce branches instead of thorns. Ex. apple, pear, gooseberry.

b. The thorn is distinguished from the prickle (43) by its woody structure, and its connection with the wood of the stem, while the prickle, as of the rose, consists of hardened cellular tissue, connected with the bark only.

172. That point in the stem where the leaf, with its axillary bud, is produced, is called the NODE, and the spaces between them the INTERNODES.

a. In the internodes the fibres of the stem are parallel, but at the nodes this order is interrupted in consequence of some of the *inner* fibres being sent off laterally into the leaf-stalk, occasioning, more or less, a jointed appearance. Hence, also, each internode contains fewer fibres, and is of a less diameter than those below it, so that the axis gradually diminishes upwards.

173. Since the branches arise from *axillary* buds, their arrangement upon the stem will depend upon that of the leaves, which, in all young plants, at least, are arranged with great symmetry and order.

174. It is a general law in the arrangement of the leaves and indeed of all other appendages, that they are disposed *spirally,* that is, in a line which winds around the axis like the threads of a screw.

a. But this arrangement is often so much disguised by disturbing causes that it can scarcely be recognized. The most common modification of it is the circular, which is readily explained. The spiral line is formed by the union of two motions, the circular and the longitudinal. The latter is produced in the growing plant by the advancement or lengthening of the axis. Now, if the latter be

interrupted from any cause, a circular arrangement is the consequence, — an arrangement so conspicuous in the organs of the flower (61, *a*, *b*, *c*), and in the leaves of the Stellatæ, and other plants.

175. When a *single* leaf arises at a node the arrangement is more obviously spiral, and is said to be *alternate*. When *two* arise at each node they are placed *opposite* to each other, and at right angles to the adjacent pairs. When *three or more* arise at each node they are disposed, of course, in a circle, and are said to be verticillate, or whorled.

176. In like manner, the arrangement of the branches, when divested of all disturbing causes, is found to be SPIRAL; that is, *alternate* in most plants, *opposite* in the ash, &c., or *verticillate* in the pine, &c.

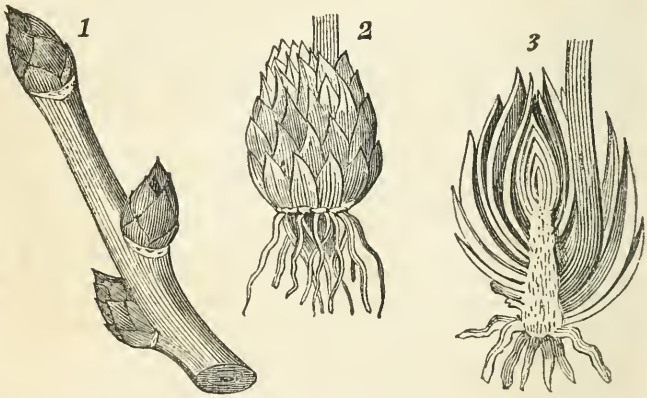

FIG. 22. — 1, Buds, terminal and lateral, with their scaly envelopes; 2, the scaly bulb of the lily, showing its analogy to the bud; 3, vertical section of the same.

a. The ascending axis is exceedingly various in form, size, position, and structure, *existing in every plant* under some one or other of its modifications. It has already been stated, that although its tendency is at first upwards, it does not always arise above the surface. Hence the primary division of this organ into *subterranean* and *aerial.*

177. The SUBTERRANEAN STEM was deemed a root by the earlier botanists, and those plants which possessed such stems only were called *acaulescent* or *stemless*, terms still in use, denoting merely the absence of *aerial* stems. The principal modifications are the bulb, corm, tuber, rhizoma, and creeper.

178. The BULB partakes of the nature of the bud. It consists of an oval mass of short, thickened scales, closely compacted in concentric circles and layers, emitting a stem from their midst, and roots from the base or *collum* (141).

a. Bulbs are said to be *tunicated* when they consist of concentric layers, each entire, and enclosing all within it, as in the Onion. But the more common variety is the *scaly* bulb, consisting of thickened concave scales, connected together at the base, as the lily, tulip.

b. The bulb is renewed annually, at the approach of winter, by the development of new bulbs in the axils of the scales, which increase at the expense of the old.

c. *Bulblets* are small, aerial bulbs, formed in the axils of the leaves upon the stem, which, when matured, fall to the ground, take root, and produce a perfect plant. The tiger-lily (Lilium bulbiferum) is an example, also several species of the onion. Such plants are termed bulbiferous.

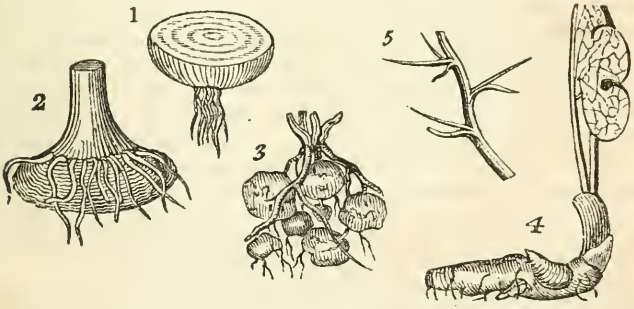

FIG. 23.—Forms of the stem;—1, Allium; 2, Arum; 3, Solanum tuberosum; 4, Sanguinaria; 5, a spinous branch.

179. The CORM is the dilated, subterranean base of a stem, resembling the bulb in form and position, but differing in structure, being composed of a uniform and solid mass, without distinction of layers or scales. It has been improperly called a *solid bulb*. Ex. Arum, or Indian turnip.

180. The TUBER is an annual, thickened portion of a subterranean stem, provided with latent buds (called eyes), from which new plants arise the succeeding year. It is the development of buds, and the fact of its origin with the ascending axis, that places the tuber among stems instead of roots. The potatoe is an example.

181. The RHIZOMA, or rootstock, is a prostrate, thickened, rooting stem, either wholly or partially subterranean, often covered with scales, which are the rudiments of leaves, or marked with scars, which indicate the insertion of former leaves, and yearly producing both shoots and roots. Such is the thickened, horizontal portion of the blood-root (Sanguinaria), sweet flag (Calamus), and the bramble (Rubus).

182. The CREEPER differs from the above only in size, consisting of slender branches, exceedingly tenacious of life, extending horizontally in all directions, and to considerable distances beneath the surface, sending out roots and branches at intervals. The witch-grass (Triticum repens) is an example. Such plants are a sore evil to the garden. They can have no better cultivation than to be torn and cut in pieces by the spade of the angry gardener, since they are thus multiplied as many times as there are fragments.

a. Repent stems of this kind are not, however, without their use. They frequently abound in loose, sandy soil, which they serve to bind down and secure against the inroads of water, and even of the sea itself. Holland is said to owe its very existence to certain repent stems, by which its shores are apparently bound together. Much of the surface of that country is well known to be even below the level of the sea. To protect it from inundation, dikes of earth have been built, with immense labor, along the coast. These dikes are overspread with a thick growth of such plants as the mat-grass, or Arundo arenaria, the Carex arenaria, and the Elymus arenarius, by the innumerable roots and creepers of which they are enabled to resist the washing of the waves.

183. To AERIAL STEMS belong the following varieties;—caulis, runner, scape, vine, trunk, sucker, offset, and stolon.

184. CAULIS (stem) is the term commonly applied to the aërial stems of herbaceous plants, which are annual in duration, and destitute of woody tissue. *Caulescent* and *acaulescent* are convenient terms, denoting, the former the presence, and the latter the absence of the caulis, or aerial stem.

185. RUNNER. This is a prostrate, filiform stem, or shoot, extending itself along the surface of the ground, and throwing out roots and leaves at its extremity, which become a new plant, soon putting forth new runners in its turn. Ex. strawberry.

186. The SCAPE is a stem which springs from the summit of the root, or rootstock, and bears the inflorescence of the plant, but not its foliage. Ex. Sarracenia, daffodil, several species of the Orchis, &c. The foliage of such plants is usually *radical*, that is, springing from the root or subterranean stem.

a. CULM (*culmus*) is a term by which the peculiar stems of the grasses, and similar plants are usually designated in descriptive botany. It seems, however, an unnecessary distinction.

187. VINE. This is a term denoting those stems which, being too weak to stand erect, creep along the ground, or any convenient support, and do not throw out roots like the runner. The vine sometimes supports itself on other plants, or objects, by means of *tendrils*, as the gourd, and most of its tribe (Cucurbitaceæ); the grape-vine, &c. Such plants are called *climbers*.

a. The *tendril* is a leafless, thread-like branch; or an appendage growing out of the petiole of the leaf; or it is the lengthened extremity of the midrib of the leaf. Its first growth is straight, and it remains so until it reaches some object, when it immediately winds and coils itself about it, and thus acquires a firm, though elastic hold. This beautiful appendage is finely exemplified in the Cucurbitaceæ and grape, above cited; also in many species of the pea tribe (Leguminosæ), where it is appended to the leaves.

188. The *twining* vine, or stem, having also a length greatly disproportionate to its diameter, supports itself on other plants or objects, by entwining *itself* around them, being destitute of tendrils. Thus the hop (Humulus) ascends into the air by foreign aid, and it is a curious fact that the direction of its windings is always the same, namely, with the sun, from right to left; nor can any artificial training cause it to reverse its course. This appears to be a general law among twining plants. Every individual plant of the same species revolves uniformly in one direction although opposite directions may characterize different species. Thus the Convolvulus revolves from left to right, against the sun.

189. TRUNK. This is the name given to the peculiar stems of trees. It is the central collum, or axis, which supports their branching tops, and withstands the assaults of the wind by means of the great firmness and strength of the woody or ligneous tissue in which it abounds.

a. The trunk often attains to great dimensions. The white pine (Pinus strobus) of the American forest, with a diameter of 6 or 7 feet, sometimes attains the height of 180, or even 200 feet, with a trunk straight, erect, and without a branch for more than two thirds its length.*

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* At the first establishment of Dartmouth College, there was felled upon the college plain a tree of this species, measuring 210 feet in length. A Bombax of the South American forests, measured by Humboldt, was 120 feet in height, and 15 in diameter. The Dagon tree on the island of Teneriffe, is said to be 16 feet in diameter. Trees of the genus Adansonia, in Senegal and the Cape Verd Islands, have been found of more than 34 feet in diameter. The famous Chestnut tree on Mt. Etna, often mentioned by travellers, is 64 feet in diameter, and consequently near 200 feet circumference.

b. In regard to duration, trees differ much, some attaining their growth in a few years and immediately decaying, while on the contrary, the ordinary age of trees is beyond the age of man, and some outlive many generations, as the oak, pine.*

190. The SUCKER is a branch proceeding from the stem, or root, beneath the surface, producing leaves, &c., and throwing out roots from its own base, becoming an independent plant. Ex. rose, raspberry.

191. An OFFSET is a short, lateral branch, terminated by a cluster of leaves, and capable of taking root when separated from the parent plant. Ex. house-leek (Sempervivum).

192. A STOLON is a branch which proceeds from an elevated part of the stem, and afterwards, descending to the earth, takes root, sends up new shoots, and finally becomes a new plant. It differs from the sucker, in originating above the ground and not below it.

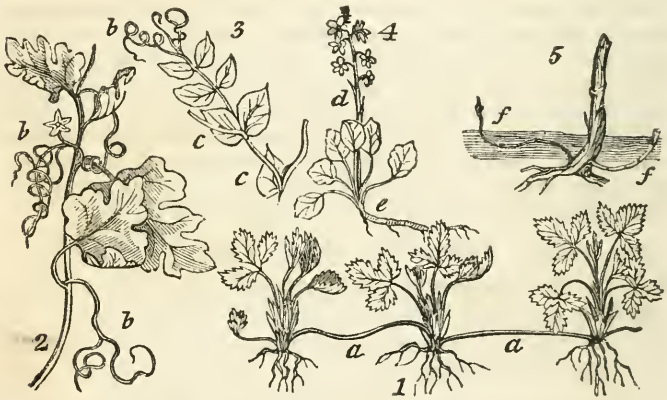

FIG. 24.—Forms of the stem; 1, Fragaria; 2, Vitis; *b*, tendrils; 3, cirrhose leaf of Pisum; 4, Pyrola; 5, sucker.

193. A *plurality* of stems, or trunks, is observed in a few species of trees growing in tropical regions. The Banyan (*Ficus*

* It is recorded that a live oak, in Louisiana, lived 1000 years; a sycamore in Palestine, 1050 years; a pine in Asia Minor, 1800 years; a cedar on Mt. Lebanon, 2120 years, and the great chestnut on Mt. Etna, 2600 years. It is also supposed that there are yet living, in the "garden of Gethsemane," some of the olives which witnessed our Saviour's passion; and at Terni, Italy, is an olive plantation supposed to have existed since the age of Pliny.

Indica), and the black Mangrove (*Rhizophora mangle*) are mentioned as examples of this singular conformation.

a. The former originally arises with a single trunk. From the principal branches, when they have become so widely extended as to need additional support, long, leafless shoots are sent down. When these shoots reach the earth, they take root, and become new trunks, in all respects similar to the first. The branches thus supported still continue to advance, and other trunks to descend, until a single tree becomes a grove or forest. There is, in Hindostan, a tree of this kind, called the Banyan, which is said by travellers to stand upon more than 3000 trunks, and to cover an area of 7 acres. The Mangrove tree is a native of the West Indies. The new trunks of this tree are said to be formed from the seeds which germinate without becoming detached from the branches, sending down remarkably long, tapering radicles to the earth.

§ 1. OF THE PHYSIOLOGICAL STRUCTURE OF THE EXOGENOUS STEM.

194. The substance of *herbaceous* stems is soft and succulent, consisting almost wholly of cellular tissue, traversed longitudinally by some few bundles (strings) of woody fibre and vascular tissue, which diverge from the main stem into the leaves.

195. This is essentially the structure of the *first year's* growth of *perennial* plants also. Cellular tissue constitutes the framework of the yearly shoots of the oak, as well as of the annual pea, but in the former it becomes strengthened and consolidated by the deposition of ligneous fibre in subsequent years.

a. Plants differ in respect to the arrangement of these fibres and vessels, and in the mode of their increase; on this difference is based that first grand distinction of Phænogamous plants into Exogens and Endogens, to which allusion has already been made (126—7).

196. The division of Exogens (outside growers) includes all the trees and most of the herbaceous plants of temperate climates, and is so named because the additions to the diameter of the stem are made *externally* to the part already formed.

197. The division of Endogens (inside growers), including the grasses, and most bulbous plants of temperate regions, and the palms, canes, &c. of the tropics, is named from the accretions of the stem being made *within* the portions already formed.

198. In the exogenous structure, the stem consists of the pith, wood, and bark.

199. The PITH (*medulla*) occupies the central part of the stem. It consists of a light, spongy mass of cellular tissue, is chiefly abundant in young plants, and appears to be serviceable only in the earlier stages of growth. It is then pervaded by fluids; but as the plant advances in age, it becomes dry, being filled with air only, and much diminished in volume.

FIG. 25.—Exogens,—oak, fir, &c.; Endogens, palm (American), Agave, &c.

200. Immediately around the pith is formed the MEDULLARY SHEATH, which is a thin, delicate membrane of vascular tissue (33), sending off a portion of its spiral vessels to the stalk and veins of each leaf. This, with the leaves, is the only part of exogenous stems which usually contains spiral vessels.

201. The WOOD is composed of concentric zones, or layers, pervaded and intersected by the medullary rays (204). The first, or inner layer, together with the pith and medullary sheath, is the product of the first year. One new layer is formed each successive year, during the life of the plant; hence the whole

number of layers, if counted at the base, will correctly indicate the age of the tree.

202. Each woody layer is composed of ligneous fibre, vasiform tissue, and ducts (33, *f*). The first gives strength and solidity to the trunk, and determines the direction of the cleavage.

a. The *ducts* are always first formed and lie in the inner part next the centre, while the *fibres* are produced towards the end of the season, and are deposited in the outer parts of the zone. The former are distinguished by the large size of their open ends, while the woody fibres are more minute and compact. This circumstance renders the limits of each layer distinctly perceptible in a cross section of the stem.

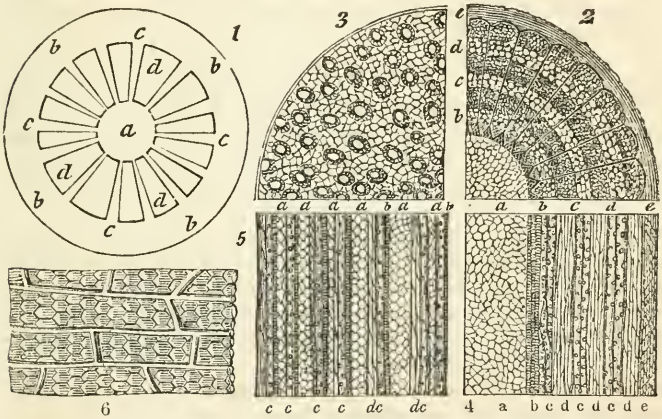

FIG. 26.—Sections of wood; 1, 2, 3, horizontal, 4, 5, vertical. 1, Exogenous stem of one year's growth; *a*, pith, *b*, bark, *c*, medullary rays, *d*, woody bundles of fibre and vessels; 2, stem of three years' growth, *a*, pith, *e*, bark, *b*, *c*, *d*, successive annual layers; 4, a, pith, b, spiral vessels of the medullary sheath, c, dotted ducts, d, woody fibre, e, bark; 3, Endogenous stem, exhibiting the bundles of woody fibre, spiral vessels, and ducts, irregularly disposed in the cellular tissue; 5, *a*, cellular tissue, *b*, spiral vessels on inner side of *c*, dotted ducts, *d*, woody fibre on the exterior side. 6, Laticiferous vessels of the bark.

203. The outer and more recent portion of the layers constitutes the ALBURNUM (*albus*, white), or sap-wood. This is usually of a softer structure and lighter color than the rest of the wood, and it is through the vessels of these layers alone, that the sap ascends. The interior layers of the alburnum gradually harden by the deposition of solid secretions in their vessels, until they can no longer allow the passage of fluids through them. Thus the DURAMEN (*durus*, hard), or heart-wood is formed, the texture of which is firm and durable. It is only the duramen which is useful in the arts.

204. The MEDULLARY RAYS are those fine lines which appear in a cross section of the stem, radiating from the pith to the bark, intersecting all the intervening layers. They consist of thin, firm plates of cellular tissue; being, like the pith, the remains of that tissue, which at the first constituted the whole of the stem.

a. These rays are quite conspicuous in vertical sections of the oak, or the maple, where they are sometimes called the *silver grain.*

205. The BARK is the external covering of the stem, consisting of several integuments, of which the outer is the *epidermis* (35), that next within the *cellular integument*, and the inner the *liber.*

206. The structure of the two outer integuments is chiefly cellular, and that of the inner, or liber, is both cellular and woody. The cellular integument is very thick in Quercus suber, and constitutes that useful substance *cork.* The *liber* (Lat. the inner bark, hence a book, because it was manufactured into parchment) is usually thin, delicate, and strong, and has been often applied to useful purposes, as in those trees of Polynesia from which cloth, mats, and sails are made.

207. At the end of the spring a portion of the sap, now transformed into a viscid, glutinous matter called *cambium*, is deposited between the *liber* and the *wood*, becomes organized into cells, and forms a new layer upon each. Soon afterwards, the new layers are pervaded by woody tubes and fibres, which commence at the leaves and grow downwards. Thus the number of layers formed in the bark and wood will always be equal.

a. Since the growth of the bark takes place by *internal* accretions, it follows that the older layers must be carried outwards and continually expanded. Thus, although smooth and entire at first, they at length become shaggy and rough, with longitudinal furrows and ridges, and finally they are cast off, as in the hemlock, spruce, walnut, &c. Not unfrequently, however, the older layers are extended in horizontal grains, or fibres, encircling the stem, as in the white birch (Betula papyracea).

b. The peculiar virtues or qualities of the plant reside in the bark rather than in the wood; hence this is the part chiefly used for medicine, dyes, tannin, &c.

c. That vascular system which is peculiar to the bark, serving for the circulation of its fluids, is called the *laticiferous tissue* (34). It exists in the form of a complete network of vessels, through which the sap moves in all directions.

§ 2. FUNCTIONS OF THE STEM.

208. We have already stated (156) that the stem serves to convey the sap from the roots to the opposite extremities of the plant.

209. That portion of the stem which serves this important purpose is the alburnum (203). Through its ducts and fibres the sap is elevated to the *leaves*, with the vessels of which they communicate. Having been there elaborated by *exhalation* and *decomposition* into a certain nutritious fluid called *latex*, it descends by the laticiferous tissues of the liber. Of this descending sap a part is carried *inward* from the bark by the medullary rays, and thus diffused through the whole stem; the remainder descends to the roots, and is in the same manner diffused through their substance, both for their nourishment, and for the purpose of maintaining the conditions requisite for *endosmose* (159, *a*).

§ 3. OF THE ENDOGENOUS STRUCTURE.

210. In the *endogenous* stem there is no distinction of pith, wood, and bark, nor does a cross-section exhibit any concentric arrangement of annual layers. (Fig. 26; 3, 5.)

211. It is composed of the same tissues and vessels as that of the exogen, that is, of cellular tissue, woody fibre, spiral vessels, and ducts; the first existing equally in all parts of the stem, and the rest imbedded in it in the form of bundles.

212. Each bundle consists of one or more ducts, with spiral vessels adjoining their *inner* side next the centre of the stem, and woody fibres on their outer side, as in the exogen.

a. A new set of these bundles is formed annually, or oftener, proceeding from the leaves and passing downwards in the *central* parts of the stem, where the cellular tissue is most abundant and soft. After descending awhile in this manner, they turn outwards, and interlace themselves with those which were previously formed. Hence the lower and outer portions of the palms, and other endogens, become exceedingly dense and hard, even so as to resist the stroke of the axe.

CHAPTER XII.

THE LEAF.

213. The leaf constitutes the verdure of plants, and is by far the most conspicuous and beautiful object in the scenery of nature. It is also of the highest importance in the vegetable economy, being the organ of *digestion* and *respiration*.

214. The leaf is characterized by a thin and expanded form, presenting the largest possible surface to the action of the air and the light, which agents are indispensable to the life and increase of the plant.

215. The color of the leaf is almost universally green, which of all colors is the most agreeable to the eye; but its intensity varies by infinite shades, and is often finely contrasted with the more delicate tints of the flower. Towards maturity its verdure is changed, often to the most brilliant hues, as red, crimson, orange, yellow, giving our autumnal forest scenery a gaiety, variety, and splendor of coloring, which the wildest fancy could scarcely surpass.

a. The color of the leaf is due to minute globules, or grains, called *chlorophyll* (green leaf), adhering to the insides of the cells, just beneath the cuticle, and composed of carbon and hydrogen, with a small proportion of oxygen. Their change of color in autumn, is stated by Macaire to depend upon their oxydation. As the leaves in autumn absorb more oxygen by night than they evolve by day, an excess is gradually added to the chlorophyll, which changes the green first to yellow, then to orange, red, and crimson successively, according to the quantity absorbed. The same effect may be produced by acids.

b. As flowers are modifications of leaves, it is probable that their various and splendid coloring is due to the same source, namely, the modifications of the chlorophyll by various degrees of oxydation, or by the presence of acids or alkalies in the cells.

§1. VERNATION.

216. A leaf-bud contains a collection of undeveloped leaves, folded together in such a manner as to occupy the least possible space. The particular manner in which the young leaves are folded in the bud, varies in different species, and is called VERNATION.

a. The vernation of the leaf is exhibited in a most interesting manner, by making, with a keen instrument, a cross-section of the bud in its swollen state, just before its expansion; or it may be well observed by removing the scales.

217. The forms of vernation are mostly similar to those of æstivation (108), and are expressed by similar terms. Some of the principal are the following:

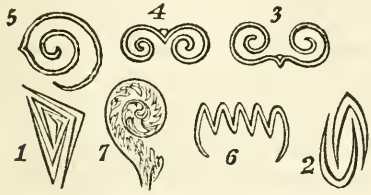

FIG. 27.—Forms of vernation. The numbers agree with the corresponding paragraphs.

1. *Equitant*, overlapping each other in a parallel manner, without any involution, as in the leaves of the Iris.

2. *Obvolute*, one of the margins of each leaf interior and the other exterior to the margin of the leaf opposite. Ex. sage.

3. *Involute*, having the edges rolled inwards. Ex. apple, violet.

4. *Revolute*, the margins rolled outwards or backwards. Ex. willow, rosemary.

5. *Convolute*, the leaf wholly rolled up from one of its sides, as in the cherry.

6. *Plaited*, each leaf folded like a fan. Ex. vine, birch.

7. *Circinate*, when rolled downwards from the apex. Ex. sundew, fern.

§ 2. ARRANGEMENT.

218. In regard to their insertion upon the axis, the arrangement of the young leaves in the bud is nearly or quite circular, but by the development of the axis, this arrangement is modified in various ways, and the leaves are then said to be

1. *Scattered*, or irregular, as in the potatoe.
2. *Alternate*, one above the other, on opposite sides. Ex. pea.
3. *Opposite*, two against each other at the same node (172). Ex. Hydrangia.
4. *Verticillate*, or whorled, more than two in a circle at each node. Ex. meadow lily.
5. *Fasciculate*, or tufted, in crowded whorls, or spires. Ex. Callitriche.

219 We have formerly shown how some of these modes of arrangement may be reconciled with the spiral (174, *a*), and we here add, that, in general, when the leaves are said to be scattered or alternate, they will be found, by the attentive observer, to be strictly, though perhaps irregularly, spiral;—always so in the annual shoot.

a. Thus in the potato-vine, above cited, or in the house-leek, poplar, &c., if we commence at the lower leaf, and draw a line to the next above it, thence to the next and so on to the sixth leaf, we shall have gone just once around the stem,

describing one turn of an elongated spire, so that each *sixth* leaf only is placed exactly above the first.

b. In the *strictly* alternate arrangement, we shall have made one complete turn on arriving at every third leaf. But this is rare. More commonly the third leaf is a little to the right or left of the perpendicular line on which the first is inserted, so that several turns must be made before we arrive at one which is exactly in that line.

c. The opposite, or whorled, arrangement may be referred to the non-development of some of the internodes; but a better theory is that which supposes several coördinate spires arising side by side: *two*, when the leaves are opposite, and *three*, or more, when they are whorled. For the leaves of the second pair, or whorl, are never placed exactly *above* those of the first, but above their *intervening spaces*, in accordance with the alternation of the petals with the sepals, &c. (61, *b*).

220. In regard to their position upon the plant, leaves are *radical*, when they grow out of the stem at or beneath the surface of the ground, so as to appear to grow from the roots; *cauline*, when they grow from the stem, and *ramial* (*ramus*, a branch) when from the branches.

§ 3. ORGANOGRAPHY.

221. A leaf may be regarded as an expansion of the two outer integuments of the bark (205) extended into a broad, thin surface by a woody framework, or skeleton, proceeding from the medullary sheath (200). This broadly expanded part is called the LAMINA, or BLADE of the leaf, and it is either *sessile*, that is, connected to the stem by its base, or it is *petiolate*, connected to the stem by a foot-stalk called the PETIOLE.

222. The petiole, therefore, where it exists, is the unexpanded part of the leaf, but like the claws of the petals (102), it is not an essential part, and is often wanting. Its form is rarely cylindric, but is usually flattened or channeled on the upper side. It is said to be

1. *Compressed*, when it is flattened in a vertical direction, so that it is agitated by the slightest breath of air, as in the aspen (Populus).

2. *Winged* (margined), when it is flattened or expanded laterally into a border. Ex. orange.

3. *Amplexicaul* (sheathing), when it is dilated at the base into a margin which embraces or surrounds the stem, as in the Umbelliferæ.

223. The lamina is generally of a rounded oval outline, longer than wide, with equal *sides* but unequal *ends*. It is, however, subject to variety almost infinite in this respect. The end of the blade next the stem is the *base*, and that most remote, the *apex*.

224. A leaf is *simple* when its blade consists of a single piece, however cut, cleft, or divided; and *compound* when it consists of several distinct blades, supported by as many branches of a *compound* petiole.

225. The frame-work, or skeleton, of the lamina above mentioned, consists of the ramifying vessels of the petiole, while the lamina itself is, of course, *parenchyma* (29, 221).

226. The manner in which the veins are divided and distributed, is termed *venation*. The organs of venation are, as they are called, the *midrib*, *nerves*, and *veins;* distinctions which must be regarded as purely arbitrary, since there is no difference in their functions, but only in their size.

227. The *midrib*, or *costa*, is the principal prolongation of the petiole, running directly through the midst of the leaf to the apex. If several such ribs of nearly equal size radiate from the base, they are called *nerves*, and the leaf is said to be three-nerved, five-nerved, &c.

228. The primary divisions sent off from the midrib, or nerves, are properly the *veins*. (In descriptive botany, however, the terms *nerves* and *veins* are too often used indiscriminately.) The secondary divisions, or the branches of the veins, are called *veinlets*.

229. There are three principal modes of venation which are, in general, characteristic of the three grand divisions of the vegetable kingdom.

1st. *Reticulate* or *net veined*, as in Exogens. The petiole is prolonged into the leaf in the form of the midrib, or several primary branches, dividing and subdividing into branchlets, which unite again, and by their frequent inosculations form a kind of network. Ex. maple, bean.

2nd. *Parallel-veined*, as in Endogens. In this kind of venation the veins are all parallel, whether proceeding from the base of the leaf to the apex, or sent off laterally from the midrib, and

are always connected by simple transverse veinlets. Ex. grass, lily.

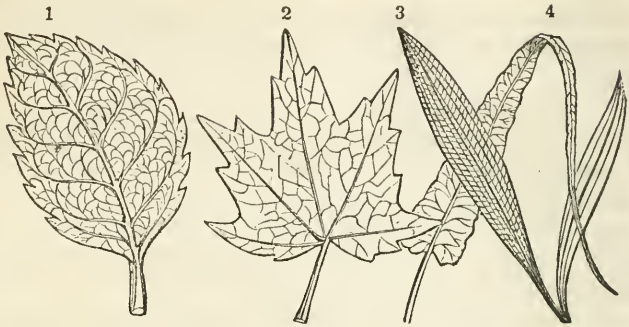

FIG. 28.—Forms of venation. 1, 2, Exogens; 3, Endogen; 4, acrogen.

3d. *Forked-veined*, as in the Cryptogamia, when the veins divide and subdivide by forked divisions which do not unite again. Ex. ferns.

230. Of the first kind of venation, the *reticulate*, there are two varieties which deserve the most careful attention. The *feather-veined* and the *radiate-veined*.

1. The *feather-veined* leaf is that in which the venation consists of a midrib, giving off at intervals lateral veins with branching veinlets. Ex. beech, chestnut.

2. In the *radiate-veined*, the venation consists of several nerves (ribs) of nearly equal size, radiating from the base towards the circumference, each with its own system of veins and veinlets. Ex. maple, crow-foot.

3. In parallel venation, the veins are either *straight*, as in the linear leaf of the grasses, *curved*, as in the oval leaves of the Orchis, or *transverse*, as in the Canna, Calla, &c.

§ 4. FORM OR FIGURE.

231. That infinite variety of beautiful and graceful forms for which the leaf is distinguished, becomes intelligible to the student only when viewed in connection with its venation. Since it is through the veins alone that nutriment is conveyed for the development and extension of the parenchyma, it follows that there will be the greatest extension of *outline* where the veins are largest and most numerous. Consequently, the form of the leaf will depend upon the direction of the veins, and the vigor of their action, in developing the intervening tissue. For this interesting theory we are indebted to Alphonse De Candolle.

a. In our description of individual forms, we shall select only the most remarkable, leaving others for explanation in the Glossary.

The most obvious arrangement is that which is founded upon the modes of the veining; but it should be premised that different forms of venation often give rise to the same outline.

232. Of FEATHER-VEINED leaves, the following forms depend upon the length of the veins in relation to each other, and to the midrib. If the middle veins are longer than the rest, the leaf will be

1, *Orbicular* (roundish), as in Pyrola rotundifolia.

FIG. 29.—Figures of feather-veined leaves. The numbers refer to paragraphs. *a*, deltate leaf of Populus.

2. *Elliptical* (oval), as in Lespedeza prostrata; or

3. *Oblong* (narrow-oval). Ex. Pyrola umbellata.

If the lower veins are longer than the rest, the leaf will be

4. *Ovate* (egg-shaped), as in the Mitchella repens, or

5. *Lanceolate* (lance-shaped), narrow, and tapering to each end. Ex. sweet-william.

When the veins are most developed towards the summit of the leaf, it becomes

6. *Obovate* (inversely egg-shaped), as in the walnut; or

7. *Spathulate* (shaped like a spathula), as in the daisy.

Again, if the lowest veins are longest, sending off veinlets backwards, the leaf will be

8. *Cordate* (heart-shaped), like the ovate form, with a hollow (sinus) at the base, as in the lilac.

9. *Auriculate,* having ear-shaped lobes at the base. Ex. sage.

10. *Hastate* (halbert-shaped), hollowed out at the base and sides. Ex. Bitter-sweet.

11. *Sagittate* (arrow-shaped), with pointed, descending lobes at base. Ex. Polygonum sagittatum; Sagittaria; &c.

12. *Reniform* (kidney-shaped), broad, rounded at the apex, and hollowed at the base, as in the Asarum Canadense.

a. The following forms depend less upon the proportion of the veins than upon the imperfect development of the tissue between them.

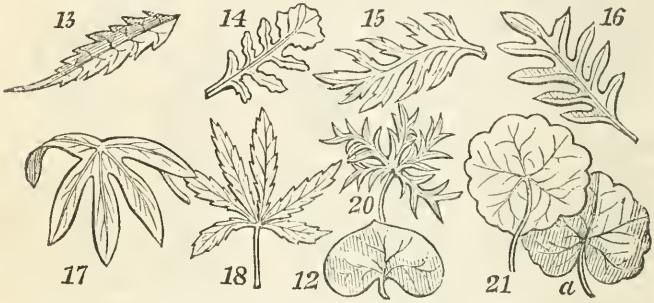

FIG. 30. — 12 — 16, figures of feather-veined leaves, the remainder of radiate-veined.

13. *Runcinate* (re-uncinate), having the margin extended at the veins into pointed segments, which curve backwards. Ex. Taraxacum.

14. *Lyrate* (lyre-shaped), with several deep, rounded sinuses, occasioned by deficiency of tissue between the lower veins. Ex. water-cress (Sisymbrium).

15. *Pinnatifid* (feather-cleft), with deep sinuses between all the veins, separating each margin of the leaf into oblong, parallel segments. Ex. Lepidium.

16. *Sinuate*, having deep, rounded openings between the veins, as seen in the leaves of the white oak.

233. RADIATE-VEINED leaves assume many forms, depending upon the direction of the veins, and the quantity of the intervening tissue. Some of them are the following.

17. *Palmate* (palm-shaped), having five lobes, with as many nerves (227) separated by deep divisions, so as to resemble the palm of the hand with the fingers. Ex. passion-flower.

18. *Digitate* (finger-shaped), having narrower and deeper segments than the palmate, as in the hemp.

19. *Pedate* (foot-shaped). The same as palmate, except that the two lateral lobes are themselves subdivided, as in the peony and passion-flower.

20. *Laciniate* (gashed), the nerves and veins all separate, as if the blade were cut and gashed with scissors. Ex. Ranunculus.

21. *Peltate* (shield-like), the nerves radiating in all directions, and all connected by intervening tissue. This form is generally also orbicular, and appears to result from the union of the base-lobes. Ex. Podophyllum peltatum, Tropeolum, Brasenia.

22. *Reniform, broad-ovate, broad-cordate*, &c., may also result from the radiate veining.

234. The form of PARALLEL-VEINED leaves is less diversified than that of the preceding classes, being

23. *Linear*, when the veins (or nerves) are straight, as in the grasses. This form may also occur in the feather-veined leaf by an equal development of all the veins, as in the Linaria vulgaris, &c.

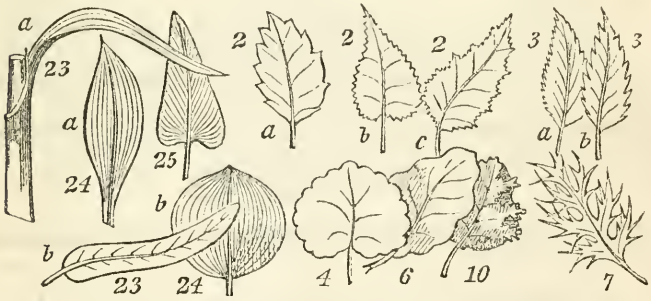

FIG. 31.—23, 24, 25, figures of leaves with parallel veins; 2—10, margins of leaves.

24. *Oval, lanceolate, oblong*, or some kindred form, when the veins are curved, as in Carex, Cypripédium, Orchis, &c., or it may be

25. *Cordate*, when some of the lower veins are curved backwards and then upwards, as in Pontaderia, and even *sagittate*, when they are directed downwards at the base, as in the Sagittaria.

26 *Accrose* (needle-shaped), when there is little or no distinction of lamina, petiole, or veins, as in the leaves of the pine.

§ 5. MARGIN.

235. The margin of the leaf is also modified chiefly by the same causes which affect the form. It is said to be

1. *Entire*, when even-edged. This may result from the full development of the tissue, or from a nerve running parallel with the margin. Ex. lilac, lily.

2. *Dentate* (toothed), the tissue incomplete, having teeth with concave edges, pointing outwards from the centre. Ex. hawkweed. If the teeth are very fine, the margin is said to be *denticulate*. If the teeth are themselves toothed, it is *doubly dentate*.

3. *Serrate*, having sharp teeth pointing forward like the teeth of a saw. Ex. Rosa. If the serratures are very small, it is *serrulate*. If they are themselves serrate, it is *doubly serrate*.

4. *Crenate*, notched with rounded or convex teeth, as in Glechoma. If such notches are very small, it is *crenulate*.

5. *Erose* (gnawed), having the margin irregularly toothed, or jagged, as if bitten by animals.

6. *Undulate* (wavy), the margin rising and falling like waves. Ex. Amaranthus.

7. *Spinous*, when the veins project far beyond the tissue in sharp spines, as in the thistle. Such leaves are said to be *armed*, and the opposite corresponding term is *unarmed*.

8. *Incised* (cut), margin divided by deep incisions.

9. *Laciniate* (torn), divided by deep and irregular gashes.

10. *Crisped*, margin much expanded and curled by a superabundance of tissue, as in the mallows.

11. *Repand*, having the margin slightly concave between the projecting veins. Ex. Solanum nigrum.

§ 6. APEX.

236. In regard to the termination of a leaf at its apex, it is said to be

1. *Acute*, when it ends with an acute angle.
2. *Obtuse*, when it ends with a segment of a circle.
3. *Acuminate*, ending with a long, tapering point.
4. *Emarginate*, having a small notch at the end.
5. *Retuse*, terminating with a round end, having the centre depressed.
6. *Mucronate*, abruptly terminated by a short, hard, bristly point, &c.

§ 7. SURFACE.

237. The following terms are employed in descriptive botany, chiefly to denote the modifications of the surface (epidermis)

of the leaf. They are, however, equally applicable to the surface of any other organs. (41, *a.*)

1. *Glabrous, smooth;* denoting the absence of all hairs or bristles. Hydrangea.
2. *Pubescent*, covered with soft hairs or down. Lonicera Xylosteum.
3. *Rough*, with hard, short, even points. Borago officinalis.
4. *Pilose*, with short, weak, thin hairs. Prunella vulgaris.
5. *Hoary*, white, with very short, dense hairs. Gnaphalium.
6. *Villose*, with long, thin hairs. Solidago altissima.
7. *Woolly*, with long, dense, matted hairs. Mullein.
8. *Tomentose*, with dense, short, and rather rigid hairs. Spirea tomentosa.
9. *Rugose*, the tissue between the reticulated veins convex, from its superabundance. Sage.
10. *Punctate*, dotted with pellucid glands (44, *a*). Hypericum punctatum.

§ 8. COMPOUND LEAVES.

FIG. 32. — Compound leaves. 4, Trifoliate leaves; *a*, pinnately, as of the bean; *b*, palmately, clover.

238. When a *simple* leaf becomes a *compound* one, the division takes place upon the same principle as the separation of an entire leaf into segments, lobes, and teeth, namely, from a deficiency of parenchyma; the number and arrangement of the leaflets will therefore, in like manner, depend upon the mode of veining.

239. The divisions of a compound leaf are called LEAFLETS, and the same distinctions of outline, margin, &c., occur in them as in simple leaves. In the truly compound leaf, each leaflet

(which is usually supported on a distinct stalk), is articulated (*articula*, a joint), with the main petiole, and separates from it in decay.

240. From the *feather veined* arrangement may result the following forms of compound leaves:

1. *Pinnate* (winged), where the petiole (midrib) bears a row of leaflets on each side, generally equal in number and opposite, as in the Acacia.

2. A pinnate leaf is said to be *equally pinnate* where the petiole is terminated by neither leaflet nor tendril, as the Cassia Marilandica, and *unequally pinnate* when it is terminated by an odd leaflet or by a tendril. Ex. rose, locust, pea. In the latter case the leaf is called *cirrhose*.

3. An *interruptedly pinnate* leaf has the leaflets alternately small and large, as in the potato, avens.

4. A pinnate leaf sometimes consists of as many as twenty or thirty pairs of leaflets, as in the Astragalus. Sometimes the number of leaflets is but three, and the leaf becomes *ternate* or *trifoliate*, as in the ash; and, finally, it is sometimes, by the non-development of the *pinnæ* (pairs) reduced to a single terminal leaflet, as in the lemon. Such a leaf is known to be compound by the articulation of the leaflet to the petiole.

5. A *bipinnate* leaf (twice pinnate), is formed when the leaflets of a pinnate leaf themselves become pinnate. Ex. Fumaria officinalis.

6. A *tripinnate* leaf (thrice pinnate), is formed when the leaflets of a bipinnate leaf become pinnate, Ex. Aralia spinosa. In the leaf of the honey-locust (Gleditschia), we sometimes find all these three degrees of division, namely, the pinnate, bipinnate, and tripinnate, curiously combined, illustrating the gradual transition of the simple to the most compound leaf.

7. A *biternate* leaf is formed when the leaflets of the ternate leaf become themselves ternate, as in Fumaria lutea.

8. A *triternate* leaf is formed when the leaflets of a biternate leaf become again ternate. Ex. Aquilegia.

241. The following forms of compound leaves may result from the division of a *radiate-veined* leaf; the *ternate*, *biternate*, &c., already mentioned;

9. *Quinate*, when there are five leaflets radiating from the same point of the petiole, as in Potentilla argentea.

10. *Septinate*, when there are seven leaves from the same point in the petiole, and so on.

242. With regard to insertion, the leaf is said to be

1. *Amplexicaul*, when its base surrounds or clasps the stem.

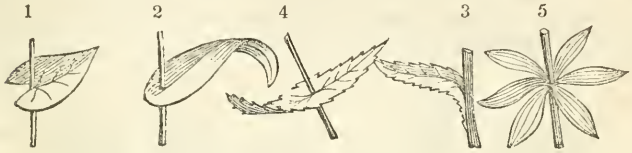

FIG. 33. — Modes of insertion.

2. *Perfoliate*, when the base lobes of an amplexicaul leaf are united together, so that the stem appears to *pass through* the leaf.

3. *Decurrent*, when the base lobes of the leaf grow to the stem below the point of insertion, so that the leaf seems to *run downwards* (Lat. *decurro*).

4. *Connate*, when the bases of two opposite leaves are united.

5. *Stellate*, verticillate, or whorled, when several leaves are arranged around the stem at the same node.

243. It is often found necessary, in the description of a plant, to combine two or more of the terms above mentioned, to express some intermediate figure or quality; thus *ovate-lanceolate*, signifying between ovate and lanceolate, &c.

a. The Latin preposition *sub* (under), prefixed to a descriptive term, denotes the quality which the term expresses, in a lower degree, as *subsessile*, nearly sessile, *subserrate*, somewhat serrate, &c.

§ 9. ASCIDIA, STIPULES, AND BRACTS.

244. In the teazel (Dipsacus) of our own fields, and in the Tillandsia, or wild pine of South America, there are hollows at the point of union between the leaf-stalk and the stem, capable of holding a considerable amount of water. The midrib and petiole of the leaves of the Arum, also, are channeled out in such a manner as to convey water to the axil.

245. But the most remarkable of all leaves are those which are hollowed out into the form of pitchers, called *ascidia*.

a. In the Sarracenia, a plant common in our own peat-bogs, these pitchers are evidently formed by the very deep channeling of the petiole, and the uniting together of the involute edges of its winged margin so as to form a complete vase, with a broad expansion at the top, which may be regarded as the true leaf.

The *ascidia* thus formed are always full of water, in which insects are drowned, being prevented from escaping by the deflexed hairs at the mouth.

246. The Nepenthes is a native of the East Indies. Its proper leaves are sessile and lanceolate. The midrib extends beyond the apex, like a tendril, to the length of six or eight inches. The extremity of this tendril is inflated into a hollow vessel similar to a pitcher, and usually contains about half a pint of pure water. It is furnished with a leafy lid, connected to it by a ligament which expands or contracts according to the state of the atmosphere, so that the cup is open in damp weather to receive moisture from the air, and closed in dry weather to prevent its evaporation.

FIG. 34.—Ascidia. 1, Sarracenia purpurea; 2, Nepenthes distillatoria; 3, Dischidia Rafflesiana.

247. Another wonderful provision of this kind is observed in a plant growing in the forests of India, called Dischidia. It is a twining plant, ascending the tall trees to the distance of 100 feet from its roots, and destitute of leaves except near its top. These cannot, therefore, it would seem, derive much nourishment from the earth. The pitchers seem formed of a leaf with its edges rolled towards each other, and adherent, and its upper end, or mouth, is open to receive whatever moisture may descend into it, of which there is always a considerable quantity. But the greatest marvel in its structure is yet to be described. Several bundles of absorbent fibres, resembling roots (142, *b*), are sent out from the nearest parts of the stem and enter the pitchers and spread themselves through the cavity. The design of this apparatus scarcely needs be mentioned.

248. The leaf of Venus' fly-trap (Dionæa muscipula), native at the south, is also of a very curious construction. At the extremity of each leaf are two lobes, bordered with spines. In the cavity between the lobes are several sharp points projecting upwards, and a gland which secretes a liquor attractive to insects. But when an unlucky fly, in search of food, alights upon it, the irritable lobes instantly close and impale him in their fatal embrace.

249. Stipules are certain leaf-like expansions situated on each side of the petiole, at its base. They are membranous, leathery, or spiny. They do not occur in every plant, but are pretty uniformly present in each plant of the same natural order Ex. pea, rose, Viola tricolor.

250. Stipules are generally supposed to be *accessory leaves*, although their

nature is certainly obscure. They are subject to the same laws of venation and form, perform the same functions, and are sometimes almost undistinguishable from the leaves themselves. They also (very rarely) develop buds in their axils.

a. When they grow from the stem itself, they may, therefore, be regarded as rudimentary *leaves*, but when from the base of the petiole, as is most common, they are the undeveloped *leaflets* of a pinnate leaf, as in the rose.

251. When leaves are furnished with stipules they are said to be *stipulate*, and when without them they are *exstipulate*. The stipules which are situated at the base of *leaflets* are called *stipels*.

FIG. 35. — Stipules, Bracts, &c. 1, *a*, stipule of grass; 2, *b*, of rose; 3, *c*, bract of Tilia; 4, *d*, of a Campanula; 5, Sium, *a*, involucre, *c*, involucel; 6, Cornus Canadensis, *a*, colored involucre, *c*, flowers; 7, Arum, *a* spathe, *c*, spadix.

252. Bracts, called also *floral leaves*, are leaf-like appendages, intermediate between leaves and the floral organs. From leaves they are generally distinguished by their being placed near the flower, their smaller size, their difference in form, and often in color.

253. That bracts are of the same nature as leaves is perfectly evident, for so gradual is the transition between them that no absolute limits can be assigned. That they have a common origin with the sepals of the calyx also, is equally evident, — so imperceptibly do the latter pass into bracts; affording one of the strongest proofs of the doctrine of floral metamorphosis.

a. Bracts have received different names, according to their arrangement and situation. They constitute an

254. *Involucre*, when they are arranged in a whorl, and surround several flowers. In the Phlox, and generally, it is green,

but sometimes, as in the Cornus, it is colored like petals. Situated at the base of a compound umbel (305, *a*) it is called a *general involucre*, at the base of a partial umbel a *partial involucre*, or *involucel*, both of which are seen in the Umbelliferæ.

255. In the Compositæ the involucre consists of imbricated bracts, often in several whorls surrounding the base of the heads (compound flowers), as the calyx surrounds a simple flower.

256. In the grasses, the bracts subsist under the common name of husk or chaff, to which is attached the *awn* or *beard*. The bracts situated at the base of a spikelet of flowers, are called the *glume*, corresponding to the involucre. Those situated at the base of each separate flower are *paleæ*, answering to the calyx, or corolla. The pieces, of which each glume or palea is composed (generally two), are called *valves*.

§ 10. DURATION.

257. Leaves, although so universal an accompaniment of vegetation, are only temporary appendages. They rapidly attain their growth, and in a great majority of cases flourish but a single season, at the end of which they perish, although the plant on which they grew may continue to flourish for ages. To mark their duration more accurately, leaves are said to be

1. *Fugacious*, when they fall off early, before the end of summer.
2. *Deciduous*, when they endure for a single season and fall in autumn.
3. *Persistent*, or *evergreen*, when they remain through all seasons, retaining their color until the new leaves of the following spring appear, so that the plant is always verdant. In accordance with the last two distinctions, plants are said to be DECIDUOUS, or EVERGREEN.

258. The *fall of the leaf* in temperate climates, occurs near the end of autumn, and marks an important era in the year. The first symptoms of decay are seen in the changes of color from green to various shades of gold and crimson. These gorgeous hues, gradually fading, at length give place to a pale russet, the common color of the faded leaf.

259. *Defoliation*, or the separation of the leaf from the stem, is due to several causes. During the latter part of the summer, the vessels become clogged by the deposition of earthy and solid matter contained in the sap, until they can no longer admit the free circulation of the fluids through them. The whole structure consequently loses its vitality, dries up, and withers, and is finally cast off at the point of articulation, as a dead part is from the living body of an animal.

§ 11. PHYSIOLOGICAL STRUCTURE.

260. Since the frame-work of the leaf is merely a divergent portion of the medullary sheath (200), it must consist essentially of the same tissues, namely, spiral vessels accompanied by woody fibre, that is, *fibro-vascular* tissue.

a. The tissue of the lamina, in like manner, must essentially correspond with the outer integuments of the bark, of which it is but an extension. That peculiar form of *cellular tissue* of which it is composed is called *parenchyma.*

261. The parenchyma of the leaf exists in two layers, as might be inferred from the manner in which it is produced (221). In all those leaves which are ordinarily horizontal in position, one surface being upwards and the other downwards, these two layers are dissimilar in structure; but in those leaves where the lamina is vertical, as in the iris, they do not materially differ.

a. The whole structure is, of course, clothed with the epidermis.

262. The internal structure of the parenchyma is more complicated than would be at first supposed. A powerful microscope is necessary for its examination. Let an exceedingly thin *paring* be taken from a vertical section of the lamina and submitted to the solar (or compound) microscope, in such a manner that the rays shall pass from section to section. Fig. 36 represents a magnified view of such a paring of the leaf of the lily, which may be regarded as characteristic of leaves in general.

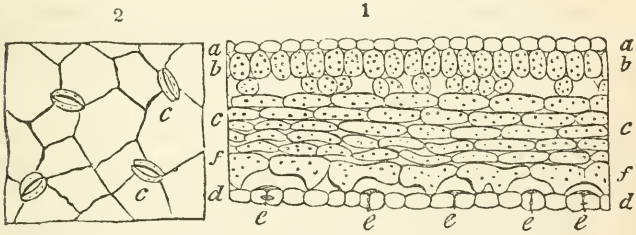

FIG. 36. — 1, Magnified section of a leaf of the lily; 2, of the epidermis with stomata.

263. The upper surface (*a*, *a*) is thus seen to consist of the flattened cells of the epidermis, arranged in a single layer. Just beneath this (*b*, *b*) is the more compact part of the parenchyma, consisting of a layer of oblong cells placed in such a position that their longer axis is perpendicular to the leaf's surface. Next below we meet with the parenchyma of the lower surface (*c*, *c*), composed of oblong cells arranged longitudinally, and so loosely compacted as to leave larger empty spaces between. Lastly, we find again the epidermis (*d*, *d*) of the under surface with stomata (*e*, *e*), opening into air-chambers.

a. Within all the vesicles of the parenchyma are seen adhering to the walls, the green globules (chlorophyll) which give color to the parenchyma, — dark

green above, where it is more compact; but paler beneath, where the cells are more loose and separate.

264. The empty spaces between the cells, called intercellular, communicate with the external air by means of the stomata (37—39), which are generally found only in the *lower* surface. In those leaves, however, whose position is naturally vertical instead of horizontal, stomata are found equally on *both* surfaces. In other leaves, as in the Nymphæa, they are found upon the *upper* surface alone, the lower being in contact with the surface of the water.

265. The *vessels of the latex* (34) are distributed through the under layer of the parenchyma. These are prolongations of the ramified veins, which, having reached the edge of the leaf, double back upon themselves, pervade the lower surface, and are again collected into the petiole, through which they are finally returned into the bark.

266. A singular structure occurs in the Oleander of Barbary, and other plants of hot and arid regions. The epidermis on the upper surface is double and very compact, and there are few if any stomata on the lower surface, their places being supplied by cavities within its substance, opening outwards by a small aperture, and covered within by minute hairs. These peculiarities are adapted to the conditions of the air and soil in which the Oleander flourishes. The hairs absorb moisture from the air, which the cavities readily retain, while the double epidermis effectually restrains its evaporation.

§ 12. OF THE FUNCTIONS OF LEAVES

267. These are *exhalation*, *absorption*, *respiration*, and *digestion*, and the result of their combined action is the conversion of the *crude sap*, absorbed from the soil by the roots, into the *proper juice* or *latex*, for the nourishment and increase of the plant, with its various products.

268. The crude sap consists of water holding in solution minute quantities of various kinds of solid and gaseous matter derived from the soil. In its passage from the root to the leaves, its composition is somewhat modified by dissolving the previously formed secretions, which it meets with on its way.

269. Exhalation is the process by which the superabundant water of the sap is given off to the atmosphere, so that the remaining sap is reduced, as it were, by *concentration*, and contains a greater proportion of solid matter. It is analogous to perspiration in animals.

270. It is to be distinguished from evaporation; the latter depending solely upon heat and the state of the air, and being, in plants, almost wholly restrained by the epidermis.

271. Exhalation appears to take place through the stomata

alone. But since these are opened by the influence of the light and closed in its absence, it follows that exhalation can proceed only in the presence of the light (155).

a. If a plate of glass be held near the *under* surface of an active leaf of the Hydrangea, in a still air, it will soon be covered with dew; but if the experiment be repeated by holding the glass over the *upper* surface, it will remain dry. Again, if the *light* be suddenly excluded from the plant in a state of active growth, it will immediately cease to transpire, whatever be the temperature; and if the stomata be then examined they will be found *closed.*

272. That exhalation and absorption by the roots are mutually dependent upon each other, has already been stated (155). The *quantity* of fluid discharged by the former may therefore be inferred from that of the latter. This has also been confirmed by experiment. A sunflower 3½ feet high, was ascertained by Hales to transpire from 20 to 30 oz. of water daily; a cabbage from 15 to 25 oz., &c. Experiments have also been made upon single leaves, recently plucked, with the petiole immersed in water. Thus a leaf of the sunflower, weighing 31 grains, absorbed and exhaled its own weight of water in 6 hours.

273. Absorption is primarily the office of the roots (154), but in certain circumstances it is performed by the leaves also.

a. When the roots are imperfect, or wanting, or serve merely to fix the plant in its position, as in some aerial parasites, and in some of the Orchidaceæ, it is evident that the plant must derive its nourishment chiefly from the absorption performed by the leaves. Experiment also proves that the leaves of plants in general are capable of this function. Every one knows how plants, when parched and withered by drought, are revived by a shower which does not reach their roots, but only moistens their leaves.

274. The lower surface of the leaf appears to be chiefly instrumental in absorption. This is readily shown by experiment. Leaves with their lower surfaces in contact with the water, remain fresh much longer than others with their upper surfaces thus placed. Leaves of the white mulberry, with the upper surface only in contact with water, faded in six days, while others, reversed in position, lasted as many months.

275. Respiration in plants is analogous to respiration, or *breathing,* in animals. In both it is equally constant and equally necessary. It is performed principally by the leaves, but is not confined to them, being partially performed by other parts also, even by the roots.

276. Respiration consists of the absorption of oxygen from the atmosphere, accompanied by the evolution of carbonic acid.

a. This process must not be confounded with another which occurs, of a contrary nature, treated of under the head of digestion.

277. Respiration appears to be going on constantly, by day and by night, during the life of the plant, even while it is actively engaged in the contravening process of the *fixation* of carbon. The result of it is, the removal of a certain superfluous portion of carbon, in a state of combination with oxygen,* from the nutritive substances of the plant, just as the same deleterious acid is removed from the blood of animals by breathing.

278. Let a few healthy plants be placed under a bell-glass containing air from which all the carbonic acid has been previously removed. After a few hours let the air be tested by shaking it with lime-water, and it will be found to contain carbonic acid, rendering the lime-water turbid. This effect will be produced, whether the bell-glass stand in the sunshine or in darkness, but the quantity of acid evolved will be found to be much greater in the darkness.

279. Respiration is carried on with peculiar activity during the two periods of *germination* and *flowering*.

a. In germination pure oxygen is absorbed, either from the air or water, or both, in the absence of light (133, *d*), and returned to the air combined with the superfluous carbon of the starch, which thus is converted into sugar for the nourishment of the young plant.

b. It is also equally active at the time of flowering, a large quantity of oxygen being converted into carbonic acid by the flower. By this process it seems that the starch previously contained in the disk (107), or receptacle (59), is changed into saccharine matter for the nutrition of the pollen and ovules (70, 81), the superfluous portion flowing off in the form of honey. And it has been ascertained that the quantity of oxygen evolved bears a direct proportion to the development of the disk.†

280. The life of the plant depends upon the continuance of respiration, for if it be surrounded by an atmosphere with too great a proportion of carbonic acid, or in a confined portion of air, which has become vitiated by its own action, and *excluded from the light*, its respiration is necessarily soon suspended, and it speedily perishes.

281. Digestion, in plants, consists properly of all those changes effected by the leaves in rendering the crude sap fit for the purposes of nutrition. But that process which is more par-

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* Carbonic acid is composed of 6 parts (by weight) of carbon, combined with 16 parts of oxygen.

† Thus Saussure found that the flower of the Arum, while in bud, consumed 5 or 6 times its own volume of oxygen in 24 hours; during the expansion of the flower, 30 times, and during its withering, 5 times. When the floral envelopes were removed, he found that the quantity of oxygen consumed by the stamens and pistils in 24 hours, was, in one instance, 132 times their own bulk.

ticularly described under the head of digestion, consists in *the decomposition of carbonic acid by the green tissues of the leaves, under the stimulus of the light, the fixation of the solid carbon, and the evolution of pure oxygen.*

282. Carbon is one of the principal ingredients in the vegetable structure. The chief source from which plants obtain it is the atmosphere, which always contains it in the form of carbonic acid, evolved by combustion, by the respiration of animals, from the earth, &c.

a. 'Now if we place some fresh leaves in an inverted bell-glass, containing air charged with 7 or 8 per cent. of carbonic acid, and expose them to the direct light of the sun for a few hours, it will be found that a large proportion of the carbonic acid will have disappeared, and will be replaced by pure oxygen.' But this change will not be effected in the dark, or by any degree of artificial light. Accordingly we find that plants which grow in the dark become *blanched* from the want of the proper supply of carbon, on which their green color depends.

283. We have before stated that this *fixation* of carbon in the substance of the plant, contravenes the process of respiration, in which carbon is *given off.* The former occurs only in the light of day, the latter by night as well as by day. But as to the *relative* amount of carbon thus absorbed by the former process, and evolved by the latter, there can be no reasonable doubt; for when we consider how large a portion of the tissues of every plant is solid carbon, and that too, derived chiefly from the atmosphere, it is evident that much more carbonic acid is, on the whole, consumed by vegetation than is evolved. In accordance with this are the results of the experiments of Dr. Daubeny, who has recently shown, that 'in fine weather, a plant, consisting chiefly of leaves and stems, if confined in a capacious vessel, and duly supplied with carbonic acid during sunshine, as fast as it removes it, will go on *adding to the proportion of oxygen* present, as long as it continues healthy.'

284. Thus are the two great kingdoms of nature rendered mutually subservient, each to the well-being, and even the existence, of the other. Animals require an atmosphere comparatively pure, although, by their respiration and decay, they are continually adding to the proportion of its deleterious gases. Plants, on the other hand, thrive by the decomposition of these gases and the restoration of pure oxygen to the air in their stead. It is impossible not to admire this beautiful arrangement of Providence, by which, as in a thousand other cases, the means and ends are rendered reciprocal, affording the highest proof of wisdom and design.

CHAPTER XIII.

INFLORESCENCE.

285. INFLORESCENCE is a term denoting the arrangement of the flowers upon a stem or branch.

286. In regard to *position* upon the stem, the inflorescence, like the leaf-bud, of which we have shown it to be a modification, is either *terminal* or *axillary*.

a. It is, however, in some plants, particularly in the potatoe tribe (Solanaceæ), situated *opposite* to a leaf. This irregularity is accounted for, if we suppose, with Lindley, that the flower-stalk, originating in the axil of the leaf next below, adheres to the internode (172) in its lower part, and does not separate from it until it is opposite the succeeding leaf.

287. The PEDUNCLE (flower-stalk) is that part of the stem on which the inflorescence is immediately supported. It bears no leaves, or, at most, only such as are reduced in size, and altered in form, called bracts (252). If the peduncle is wanting, the flower is said to be *sessile*.

288. The peduncle, like the stem of which it is a portion, may be either *simple* or *branched*. When it is simple it bears, of course, a single flower, but when it is divided into branches it bears several flowers, and its final divisions, each bearing a single flower, are called PEDICELS.

289. A SCAPE is a flower-stalk which springs from a subterranean stem, in such plants as are called stemless (177). Ex. Sarracenia, Taraxacum, Hyacinthus. Like the peduncle, of which it is a modification, it is leafless, or with bracts only, and may be either simple or branched.

290. The RACHIS (ῥαχις, the spine) is the *axis* of the inflorescence, or the main stem of a compound peduncle, along which the pedicels are arranged, as seen in the Plantago, currant, grape, and grasses.

291. The inflorescence is said to be *solitary* when it consists of a single terminal flower, as in Erythronium, or when but a single axillary flower is developed at the same node, as in Petunia, Convolvulus.

292. In regard to the evolution of the inflorescence, that is, the mode of succession in the development of the flowers, botanists have recently observed two important distinctions, namely, the *centripetal* and the *centrifugal*, the former resulting from axillary, and the other from terminal flowers.

293. In CENTRIPETAL inflorescence the evolution (blossoming) of the flowers commences with those of the *circumference* (or the base) and proceeds towards the *centre* (or the summit), as in the Umbelliferæ and the Cruciferæ.

a. The student will readily perceive that the *circumference* of a depressed (flattened) inflorescence corresponds to the *base* of a lengthened one; and also that the *centre* of the former answers to the *summit* of the latter. For when the axis, or rachis, is lengthened, it is the *centre* which it bears along with it at its apex, leaving the circumference at the base.

294. In CENTRIFUGAL inflorescence the blossoming commences with the terminal and central flower, and proceeds towards the lateral flowers, or those of the circumference. Ex. Hydrangea, elder, and the pink tribe.

a. 'This mode of inflorescence is generally indicated by the presence of a solitary flower seated in the axils of the dichotomous (forked) branches.' All the flowers are considered terminal, because they do in fact (except the first which terminates the axis) terminate *lateral branches* successively produced at the node next below the primary flower. This is beautifully illustrated in Spergula.

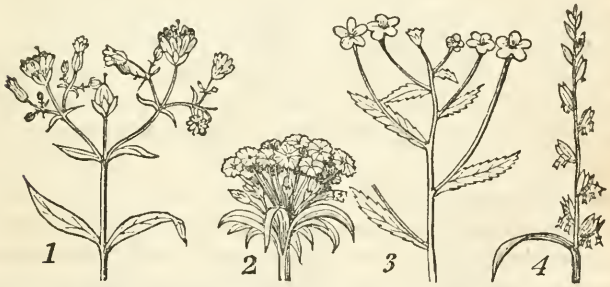

FIG. 37.—Modes of inflorescence; 1, centrifugal inflorescence (cyme) of Cerastium maximum; 2, fascicle; 3, centripetal inflorescence (corymb); 4, spike.

295. Sometimes we find these two modes of inflorescence combined in the same plant. In the Compositæ, as Dr. Gray remarks, the heads, which may be called the *partial* inflores-

cences, are centripetal, while the *general* inflorescence is centrifugal, that is, the central head is developed before the lateral ones. But in the Labiatæ the partial inflorescences (verticilasters, 309) are centrifugal, while the general inflorescence is centripetal.

296. Of centripetal inflorescence the principal varieties are, the spike, raceme, ament, spadix, corymb, umbel, head, panicle, and thyrse.

297. The SPIKE is an inflorescence consisting of several sessile flowers arranged along a common peduncle (rachis). Ex. Plantago, Verbascum.

298. The RACEME is the same as the spike, but having the flowers raised on pedicels, each being axillary to a bract, and blossoming in succession from the base upwards. The raceme may be either *erect*, as in Hyacinthus, Pyrola, or *pendulous*, as in the currant and black cherry.

299. The AMENT, or catkin, is a spike whose flowers are covered each with a scaly bract, instead of a calyx and corolla, and fall off together, all remaining still connected with the rachis. Ex. Salix, Betula.

300. The SPADIX is a spike with a fleshy rachis enveloped in a large bract, called spathe. Ex. Arum, Calla.

301. The CORYMB is the same as the raceme, having the lower pedicels so lengthened as to elevate all the flowers to nearly or quite the same level. Ex. wild thorn (Cratægus).

302. An UMBEL resembles the corymb, but the pedicels are of nearly equal length, and all arise from the same point in the common peduncle. Ex. Asclepias, Aralia hispida, onion.

303. A HEAD or CAPITULUM is similar to an umbel, but the flowers are sessile or nearly so upon the summit of the peduncle. Ex. button-bush, clover, globe-amaranth (Gomphrena).

a. But the more common kind of *capitulum* is that where the summit of the peduncle (*rachis*) is dilated into a broad disk (*receptacle*) bearing the sessile flowers upon its surface. This is the kind of inflorescence peculiar to the vast family of the Compositæ, and is equivalent to the *compound flowers* of the earlier botanists.

b. In the capitulum there is a general resemblance to the simple flower, the

rays answering to petals, and the involucre (254) to the calyx. The flowers are called *florets*, those in the outer circle, *florets of the ray*, and those of the central portions, *florets of the disk*.

304. The PANICLE is a compound inflorescence, formed by an irregular branching of the pedicels of the raceme. Ex. oats, Poa, and many other grasses.

305. The THYRSE is the same as the panicle, having the lower branches rather shorter than those in the midst, and all of them very compact, as in the lilac (Syringa), horse-chestnut.

a. The umbel becomes *compound* when each pedicel becomes itself an umbel, as in most of the Umbelliferæ. In these cases the secondary umbels are called UMBELLETS, and sometimes *partial umbels*. See § 254.

By a similar decomposition, a raceme becomes a *compound raceme*, a corymb a *compound corymb*, &c.

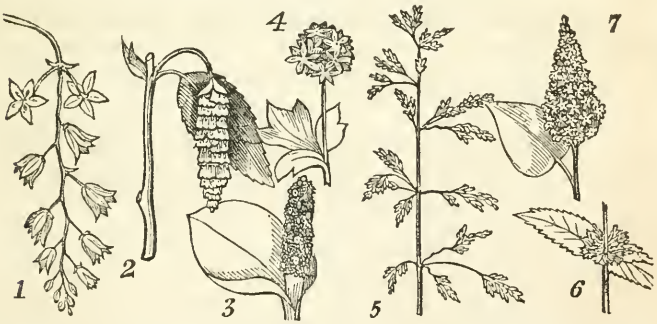

FIG. 38. — Modes of inflorescence; 1, raceme; 2, ament; 3, spadix; 4, head; 5, panicle; 6, verticillaster; 7, thyrse.

306. Of the centrifugal inflorescence, the following varieties are described; namely, cyme, fascicle, and verticillaster.

307. CYME. This inflorescence has the general aspect of the corymb, but is remarkably distinguished from it by its centrifugal evolution, and by its branches being repeatedly 2-forked and 3-forked, as exemplified in Hydrangea, Viburnum, chickweed.

a. The cyme is found only in plants with opposite leaves, and its normal structure and development are as follows. The terminal flower, which is the first to

be opened, is borne upon a peduncle of two or more nodes, which are, of course, transverse to each other (219, *c*). From one, or two, or all of these nodes, pairs of secondary, opposite peduncles arise, each of which, like the first, is binodal or multinodal, and terminated by a flower. Again, in the nodes of these secondary peduncles, may arise, in the same manner as before, pairs of tertiary peduncles, each to be terminated by a flower, and perhaps to bear still other peduncles, and so on.

b. Hence it is evident, that in each axil of the forked branches there should be a solitary flower. This, however, is often wanting. Irregularities may also be occasioned by the absence of other parts.

308. Fascicle. This is a modification of the cyme, in which the flowers become crowded, and nearly sessile, as in sweet-william, and other species of Dianthus.

309. Verticillaster or verticil, called also, though improperly, *whorl*, is a term denoting those reduced cymes which are peculiar to the Labiatæ, where two such cymes occupy the opposite axils of each pair of leaves.

a. Sometimes the peduncle, instead of producing flowers, is changed into a tendril, as in the vine.

CHAPTER XIV.

SYSTEMATIC BOTANY.

§1. OF THE CLASSIFICATION OF PLANTS.

310. SYSTEMATIC BOTANY relates to the arrangement of plants into groups and families, according to their characters, for the purpose of facilitating the study of their names, affinities, habits, history, properties, and uses.

311. The student in botanical science is introduced into a boundless field of inquiry. The subjects of his research meet him at every step: they clothe the hill and the plain, the mountain and the valley. They spring up in the hedges and by the wayside; they border the streams and lakes, and sprinkle over its surface; they stand assembled in vast forests, and cover with verdure even the depths of the ocean; they are innumerable in multitude, infinite in variety. Yet the botanist proposes to acquaint himself with each individual of this vast kingdom, so that he shall be able readily to recognize its name, and all that is either interesting, instructive, or useful concerning it, whenever and wherever it is presented to his view.

312. Now it is obvious, that if the student should attempt the accomplishment of this task by studying each *individual plant* in detail, whether with or without the aid of books, the longest life would scarcely be sufficient to make a beginning.

313. But such an attempt would be as unnecessary as fruitless. The Author of Nature has grouped these myriads of individuals into SPECIES (50). When he called them into existence in their specific forms, he endowed each with the power of *perpetuating its own kind and no other*, so that they have descended to us distinguished by the same differences of character and properties as at the beginning. When, therefore, the student has become acquainted with any one individual plant, he is also equally acquainted with *all others belonging to the same species*.

a. Thus a single stalk of *white clover* becomes a representative of all the millions of its kind that grow on our hills and plains, and a single description of the *white pine* will answer, in all essential points, for every individual tree of that ancient and noble species, in all lands where it is found.

314. Again, the species themselves, although separated from each other by obvious differences, still are found to exhibit many constant affinities, whereby they are formed into larger groups, called GENERA (52). Thus the white clover and the red (Trifolium repens and T. pratense) are universally recognized as of different species, but of the same genus; and a single generic description of any

one plant of the genus Trifolium will convey intelligence, to a certain extent, concerning every other plant belonging to its 150 species.

315. Thus the whole vegetable kingdom is grouped into species, and the species themselves into genera. But natural affinities do not stop here. The genera are still too numerous for the purpose of clear and systematic study. The naturalist would therefore generalize still further, and reduce the genera to still fewer and larger tribes or groups. Accordingly he finds, on comparing the genera with each other, that they still possess some characters in common, although, perhaps, of a more general nature than those which distinguish them among each other. These general characters, therefore, serve to associate the genera into a systematic arrangement of Classes and Orders.

316. There are two independent and widely different methods of classifying the genera, which have generally been approved, namely, the Artificial System of Linnæus, and the Natural System of Jussieu. The former has for its basis those characters which are derived from the organs of fructification, leaving all other natural affinities out of view. The latter, on the contrary, is founded upon all those natural affinities and resemblances of plants, by which Nature herself has distinguished them into groups and families.

317. In regard to the relative merit of these two arrangements there is now no longer room for comparison. That of Linnæus is truly ingenious and beautiful, and furnishes, perhaps, the readiest means for determining the *names* of plants which has ever been devised; but this must be regarded as its principal use. Indeed, its author himself did not design it for any higher end, or claim for it any higher merit.

318. But, in acquiring a thorough and accurate knowledge of the vegetable kingdom, the Natural System is not only the best, but it is the *only* method which can be relied upon for this purpose. The obscurity and misconceptions which formerly embarrassed the science of the vegetable structure, so as to render this system unavailable, have now been so far removed by the labors of De Candolle and Lindley, in Europe, and of Drs. Torrey and Gray, of our own country, that it is brought generally within the scope of the ordinary mind, and shown to be founded in true philosophy. Accordingly, it is now generally adopted.

319. Still, the difficulties attending analysis* by the Natural System alone, are confessedly too great to be successfully encountered at the threshold of the science, by him who has it yet to learn. These arise, partly from the obscurity of the characteristic distinctions employed, and partly from the remaining inaccuracies of their definitions. On this account it has been thought best to retain, in this work, the artificial characters of the Linnæan Classes and Orders, in the

* Analysis, as used in botany, denotes the dissection and examination of the organic structure of plants, in order to learn their characters, affinities, names, &c. See § 344—348.

form of *analytical tables*, to be used simply as a guide in the analysis of plants, to *point* the learner to the place in the Natural System which his specimen occupies.

320. The *artificial arrangement* consists of *classes*, *orders*, *genera*, and *species*. The two latter are the same as in the natural system (50, 51), and the two higher divisions, classes and orders, have already been seen (74, 80) to be founded upon the number, situation, and connection of the stamens and pistils.

CHAPTER XV.

OF THE NATURAL SYSTEM.

321. It is the aim of the Natural System to associate in the same divisions and groups, those plants which have the greatest *general* resemblance to each other, not only in *aspect* and *structure*, but also in *properties*.

322. While the artificial arrangement employs only a *single* character in classification, the natural seizes upon *every* character in which plants agree or disagree with each other. Thus, those plants which correspond in the greatest number of points will be associated in the smaller and lower divisions, as species and genera, while those corresponding in fewer points will be assembled in divisions of higher rank.

323. By an acquaintance, therefore, with the characters of each of the families of the Natural System, we may at once determine to which of them any new plant belongs, what are its affinities with others, and what are its poisonous or useful properties.

324. Although the aim of this System is as above stated, yet the *full consummation* of it is still reserved for a future age. At present, though greatly advanced, we are still obliged to call in the aid of artificial characters, where Nature is as yet too profound for ordinary skill. Such aid is, for example, employed in the first subdivision of Angiosperms.

325. The first and highest division of the vegetable kingdom, namely, into the *Phænogamia* or *Flowering Plants*, and the *Cryptogamia* or *Flowerless Plants*, has already been noticed, and its distinctions explained, in Chapter III., and elsewhere. These grand divisions lie at the foundation of both the System of Linnæus and of Jussieu, and are truly founded in nature; for

The PHÆNOGAMIA

1. Consist of a regular axis of growth with leafy appendages.
2. They possess a woody and vascular structure.
3. They develope flowers, and
4. They produce seeds. On the other hand

The CRYPTOGAMIA

1. Are destitute of a regular axis and of true leaves.
2. They possess a cellular structure only.
3. They do not develope flowers, and
4. They produce SPORES (129) instead of seeds.

326. These distinctive characters must not, however, be regarded as decisive in all cases; for the higher Cryptogamia, as the ferns, give indications both of a regular woody axis and of a vascular structure, while some of the lower Phænogamia can scarcely be said to produce flowers. And, universally, so gradual are the transitions from family to family and tribe to tribe, that it is impossible to fix upon characters so definite as to completely circumscribe any one group, while at the same time, they exclude every member of surrounding and approximating groups.

327. There is a small and curious order of plants of comparatively recent discovery, native chiefly of the East Indies, which appear, from the most authentic accounts of them, to form the connecting link between the Flowering and Flowerless plants, combining a part of the characters of each, so that botanists are at a loss to which it belongs. They possess a cellular structure, develope flowers immediately from the root, whence they are called Rhizanths (ῥιζη, a root, ανθος, a flower); but their ovaries are said to be filled with *spores* instead of seeds, and hence they are also called Sporogens. Ex. Rafflesia.

328. Again, the Phænogamia are very naturally resolved into two subdivisions, depending upon their manner of growth, called EXOGENS and ENDOGENS, whose distinctions are briefly as follows: —

EXOGENS,

1. Growing by external accretions (196).
2. Bearing leaves which have reticulated veins (229) and which fall off by an articulation.
3. Seeds with two or more cotyledons (127) or *dicotyledonous*.

ENDOGENS,

1. Growing by internal accretions (197).
2. Leaves parallel-veined (229) and decaying without falling off.
3. Seeds with one cotyledon (126) or *monocotyledonous.*

329. *Classes.* The groups above mentioned, comprising the whole vegetable kingdom, are again subdivided into six classes. The first two are formed from the subdivision Exogens, and are founded upon the presence or absence of the pericarp; namely,

Class I. ANGIOSPERMS, (as the oak, rose,)

1. Ovules produced within an ovary, and
2. Fertilized by the action of the pollen through the stigma.
3. Becoming seeds enclosed in a pericarp.
4. Embryo with two opposite cotyledons.

Class II. GYMNOSPERMS, (as the pine, yew,)

1. Ovules produced naked beneath a scale-like carpel.
2. Fertilized by the direct action of the pollen without the stigma.
3. Becoming truly naked seeds, that is, destitute of a pericarp.
4. Embryo mostly with several whorled cotyledons.

330. The next two classes are formed from the subdivision Endogens, and are founded upon the presence and absence of glumes or husks; namely,

Class III. AGLUMACEÆ or AGLUMACEOUS ENDOGENS,
Plants of the endogenous structure with flowers constructed on the usual plan; perianth verticillate, of one or more whorls of petaloid organs, or wanting. Ex. lily, orchis, rush.

Class IV. GLUMACEÆ or GLUMACEOUS ENDOGENS,
Plants of the endogenous structure, the flowers invested in an imbricated perianth of glumes instead of a calyx; as the grasses, grains, sedges.

331. The Cryptogamia are separated into two great classes, called Acrogens and Thallogens; the former including those tribes which make some approximation towards the Phænogamia, and the latter including the lowest tribes of the vegetable kingdom. As their names indicate, they are distinguished from each other by their manner of growth; thus,

Class V. ACROGENS (growing from ακρος, the summit or point) have a regular stem, or axis, which grows by the extension of the point, or apex only, without increasing at all in diameter, generally furnished with leaves, and composed of cellular tissue and ducts. Ex. ferns, mosses, club-mosses, and the Equisetaceæ.

Class VI. THALLOGENS, consisting merely of cellular tissue, with a tendency to grow into a flat expansion called *thallus*, but having no distinction of root, stem, leaves, or flowers. Ex. Lichens, seaweeds, liverworts, fungi.

332. *Affinities of the Six Classes.* These may be represented to the sight by the following arrangement:

Angiosperms.

Gymnosperms. Aglumaceæ.

Acrogens. Glumaceæ.

Thallogens.

Angiosperms stand in the highest rank, as they justly merit, by their superior organization. These are nearly allied to Gymnosperms by their mode of growth; and, on the other hand, to Aglumaceæ by their mode of flowering. Gymnosperms are intimately connected with Acrogens through Equisetaceæ of the latter, which stands intermediate; and the Aglumaceæ approach the Glumaceæ, almost indefinitely, through the Junceæ (rushes). Between the Acrogens and Thallogens a close relationship is established through the Musci (mosses), while the *sporogens* form the connecting link between the Endogens and the lowest tribes of vegetation, as the Fungi. Thus, from the highest rank we descend to the lowest, through Gymnosperms and Acrogens on the one hand, and through Aglumaceæ and Glumaceæ on the other, forming a *circle* of affinities.

333. The mutual relations of the six classes with the higher divisions, are presented in the following synopsis:

VEGETABLE KINGDOM;	PHÆNOGAMIA;	EXOGENS;	Class I. ANGIOSPERMS.
			Class II. GYMNOSPERMS.
		ENDOGENS;	Class III. AGLUMACEOUS.
			Class IV. GLUMACEOUS.
	CRYPTOGAMIA;		Class V. ACROGENS.
			Class VI. THALLOGENS.

334. SUB-CLASSES. The classes are next to be broken up into smaller divisions. In effecting this object most writers have employed artificial methods, since no natural one, founded upon clear and comprehensive distinctions, has yet been devised. Thus Angiosperms, which class is by far the largest of the six, is divided into three *sub-classes*. POLYPETALÆ, or POLYPETALOUS EXOGENS, flowers with distinct petals; MONOPETALÆ, or MONOPETALOUS EXOGENS, flowers with united petals; APETALÆ, or APETALOUS EXOGENS, flower with no floral envelopes, or with a calyx only.

335. ORDERS, or FAMILIES, are the most important of all the natural associations. On the accuracy and distinctness of the

characters of *these*, botanists have bestowed the highest degree of attention, and the student's progress will depend chiefly upon his acquaintance with them.

336. Orders are formed by associating together those genera which are the most nearly allied *to each other*, or to some *one genus* previously assumed as the *type*. Therefore, as the species form genera, so genera form orders.

337. In systematic works, the orders are also associated on natural principles into alliances, groups, &c., which are intermediate between these and the sub-classes, and are designated numerically, thus, group 1st, group 2d, &c., or by names derived from a leading order.

338. In regard to their extent, the orders differ very widely, some consisting of a single genus, as Sarraceniaceæ, while others comprehend hundreds of genera, as Compositæ. For convenience' sake the larger orders are broken up into sub-orders, or tribes.

339. The Natural System, with its classes and subordinate divisions, may be exhibited in one view;

The VEGETABLE KINGDOM is separated

1st, into Grand Divisions and Subdivisions.
2nd, " Classes.
3d, " Sub-classes, Alliances, and Groups.
4th, " Orders and Sub-orders.
5th, " Genera and Sub-genera.
6th, " Species and Varieties, and
7th, " Individuals.

CHAPTER XVI.

§1. NOMENCLATURE.

340. The names of the *Orders* are Latin adjectives, (feminine, plural, to agree with *plantæ*, plants, understood,) usually derived from the name of the most prominent, or leading genus, in each, by changing or prolonging the termination into *aceæ*, as *Rosaceæ*, the rose tribe, *Papaveraceæ*, the poppy tribe, from Rosa and Papaver.

a. Earlier names, however, derived from some leading character in the Order, and with various terminations, are still retained. Thus, *Compositæ*, with compound flowers; *Labiatæ*, with labiate flowers.

341. *Generic* names are Latin substantives, arbitrarily formed, often from some medicinal virtue, either supposed or real, or from some obvious character of the genus; sometimes from the native country of the plants, or from the name of some distinguished botanist, or patron of botany, to whom the genus is thus said to be dedicated. Also the ancient classic names, either Latin or Greek, are often retained. Examples of all these modes of construction will be hereafter seen.

342. *Specific* names are Latin adjectives, singular number, and agreeing in gender with the name of the genus to which they belong. They are mostly founded upon some distinctive character of the species; as *Gerardia glauca*, glaucous-stemmed Gerardia; *G. purpurea*, purple-flowered Gerardia; *G. tenuifolia*, slender-leaved Gerardia. Frequently the species is named after some other genus, which, in some respect, it resembles; as *Gerardia quercifolia*, oak-leaved Gerardia. *G. delphinifolia*, larkspur-leaved Gerardia.

343. Species, like genera, are also sometimes named in commemoration of distinguished persons. The rules given by Lindley, for the construction of such names, are, 1st, If the person is the discoverer, the specific name is a substantive in the genitive case, singular number; as, *Lobelia Kalmii*, Kalm's Lobelia; *Pinus Fraseri*, Fraser's pine. 2d, If the name is merely conferred in honor of the person to whom it is dedicated, it is an adjective ending in *nus*, *na*, *num*; as *Erica Linnæana*, Linnæus's heath; *Rosa Lawrenciana*, Miss Lawrence's rose. In these cases, and in all others where the specific name is derived from proper names, or where it is substantive, as it often is, it should begin with a capital letter.

§2. BOTANICAL ANALYSIS.

344. The application of the rules of Systematic Botany to the natural plant, in order to ascertain its affinities, place, name, &c. is called *botanical analysis.*

345. In order to be in a proper state for this kind of examination plants should be in full blossom, and fresh, that is, not with-

ered or decayed. A good lens is requisite for the examination of the minute parts of the structure, or of the flower.

346. The analysis of plants is a constant object of pursuit with the practical botanist. Without this exercise, the study of authors will be of little avail. A more accurate and useful knowledge of a plant can be acquired in a few minutes, by a careful examination of the living specimen, or even of the *dried*, than by committing to memory the most elaborate descriptions found in books. During the flowering months, the learner will often in his walks meet with plants in blossom, with which he is yet unacquainted. And he who is duly interested in his pursuit, will by no means fail to seize and analyze each specimen while the short hour of its bloom may last, and to store his memory with the knowledge of its names, habits, and uses. Thus, in a few seasons, or even in *one*, he will have grown familiar with nearly, or quite, every species of plants in his vicinity.

347. Let us now suppose the pupil in possession of a specimen of an unknown plant in full blossom. In order to study it by the aid of authors, a point immediately requisite is its name. Now, having learned by examination the organic and physiological structure of the flower, leaves, stem, &c., the experienced botanist, who has at his command the characters of all the Natural Families, will at once determine to which of them the plant belongs.

348. But this is not to be expected of the pupil who is supposed to be yet, in a measure, unacquainted with the characters of the orders. He must be guided to the place which his specimen holds in the classification, by a longer course of inquiry and comparison. For the assistance of the learner, therefore, and for the convenience of all, we are happy to be able to add a full series of ANALYTICAL TABLES, which, with proper use, will seldom fail of conducting them almost immediately, to the object of their research. See the directions.

§3. OF COLLECTING AND PRESERVING PLANTS.

349. The student in botanical science should give an early and persevering attention to the collection and preservation of specimens of as many species of plants as he can procure. The advantages to be derived from such collections, either in refreshing the memory by reviewing them, or in instituting a more thorough examination at one's leisure, are such as will afford an abundant compensation for all the labor requisite in preparing them.

a. Such a collection of dried specimens of plants is called an HERBARIUM, or by the more significant title, *hortus siccus* (dry garden).

350. The apparatus requisite for the accomplishment of this object is, 1st, a close tin box, 20 inches in length, and of a portable form; 2d, a portable press, consisting of two boards of light material, 12 by 18 inches, opening and shutting by hinges, like the cover of a book, and secured by springs (even a *large book* is a good substitute); 3d, a quantity of smooth, bibulous paper, of large size (a dozen or more quires of printing paper); 4th, eight or ten boards of the same size as the paper; 5th, a small screw-press, or several lead weights of various sizes, from 15 to 30 pounds each.

351. In gathering plants for this purpose, or *specimens*, as they are called, the smaller and herbaceous plants should be taken up with a portion of the roots, while from larger plants there should be selected a shoot, with complete representations of the leaves and flowers. They may be preserved for several days, without withering, in the tin box, or they may at once be laid between several thicknesses of the paper, and enclosed in the portable press. It is always desirable that they be gathered in a dry day; if not, they should be freed from dampness before being committed to the paper and press.

352. In drying the specimens, great care is required, that they may preserve well their natural appearance, form, and color. It is generally recommended that they be carefully spread out, as nearly in their natural position as possible, between 8 or 10 thicknesses of paper, and then submitted to pressure between the boards. The degree of pressure should never be such as to crush their parts, and may be easily regulated by the screw, or by the number and size of the weights used.

353. As often as once a day they should be taken from the press, transferred to fresh and dry paper, and returned, until they are thoroughly dried, when they are ready to be transferred to the cabinet. Others, however, recommend that the papers be not changed at all; and that the plants remain undisturbed in their position, until they are perfectly dry.

354. The next object with the collector is the arrangement of his specimens. For this purpose, each one is first to be fastened to a sheet of firm white paper, about 10 inches by 18, either by glue or with loops of paper of the same kind, or they may be stitched to the paper with a fine needle. The latter mode, if done skilfully, is preferable. Then let all those specimens which belong to the same genus be collected together and placed within a folded sheet of colored paper, with the name of the genus and each species written on the outside. Each sheet should also be labelled with the names of the plant, the locality, time of gathering, habits, &c.

355. The genera are next to be collected together into orders, each order being wrapped or folded in a still larger sheet, of a different color from that which enfolds the genera, having the name of the order, with a catalogue of its genera on the outside. Thus arranged, the orders are to be laid away upon the shelves of a cabinet, or packed in a chest. To protect the plants from the attacks of insects, pieces of camphor gum are to be placed among them, or a piece of sponge saturated with the oil of turpentine. To save them from decay, they should be kept dry, and well ventilated.

356. Fruits and seeds which are too large to be pressed with the plants, and also truncheons of wood, are to be preserved separately, in a cabinet.

INDEX AND GLOSSARY.

*** The figures refer to paragraphs.

A; (a, privative) in composition signifies without.
Abortion; an imperfect development of any organ.
Absorption, 157, 158, 272, 273, 274.
Acaulescent, 184.
Accessory; something added to the usual parts.
Accretion; the growing of one thing to another.
Accumbent; lying upon. In the Cruciferæ it denotes the radicle lying upon the edges of the cotyledons.
Acerose, 234, 26.
Achenium, 116, 9.
Achlamydeous, 51.
Acicular; needle-shaped.
Acine; a separate grain or carpel of a collective fruit.
Acotyledonous, 48.
Acrogens, 331.
Aculeate; armed with prickles.
Acuminate, 236, 3.
Acute, 236, 1.
Adherent, 97.
Adnate; growing to or upon, 69, 2.
Æstivation, 108.
Aggregate; assembled closely together.
Aglumaceous, 330.
Alæ, 105, 5.
Alburnum, 203.
Albumen, 122.
Alternative, 108, 5.
Alveolate; with partitions like a honeycomb.
Ament, 299.
Amplexicaul, 222, 3.
Anastomosing; the uniting of vessels; inosculating.
Anatropous, 121.
Ancipital; two-edged.
Andrœcium, 57, 65.
Androgynous; with both stamens and pistils.
Angiosperms, 329.
Anthelmintic; expelling or killing worms.
Animal, definition of, 11.
Antiseptic; efficacious against putrefaction.
Anther, 68.
Apetalæ, 331. Apetalous, without petals.
Appressed; pressed closely upon something else.
Apterous; without wings (or margins).
Aquatics; growing in or belonging to the water.
Arachnoid; 41, *a*.
Arboreous; tree-like.
Arborescent; belonging to a tree.
Areolæ; having the surface divided into little spaces, or areas.
Aridity; dryness.
Aril, 119.
Aristate; bearded, as in the glumes of barley.
Armed, 235, 7.
Aroma; the spicy quality of a thing.
Articulation; a joint; the place where one thing is joined to another.
Artificial Classes, 73.
Artificial Orders, 80.
Ascidia, 245.
Ascending; arising obliquely, assurgent.
Assurgent; arising in an oblique direction.
Attenuate; rendered slender or thin.
Auriculate, 232, 9.
Awn, 256.
Axil (arm-pit); the angle between the petiole and branch, on the upper side
Axillary; growing out of the axils.
Axis, ascending, 19.
Axis, descending, 19.

Baccate; berry-like, covered with pulp.
Banner, 105, 5.
Bark, 205.
Beak; a hard, short point, like the beak of a bird.
Bearded; with long awns or hairs.
Berry, 116, 14.
Bicuspidate; with two points.
Bidentate; with two teeth.
Biennial; of two years' duration.
Bifid; two-cleft.
Bifoliate; with two leaves.
Bilabiate; two-lipped.
Bifurcate; two-forked.
Binate; growing two together.
Bipinnate, 240, 5.
Bipinnatifid; twice pinnatifid.
Bisaccate; with two tumors or sacks.
Biternate, 240, 7.
Bivalved; two-valved.
Botany defined, 1.
Brachiate; with opposite spreading branches (arms).
Bracteate; having bracts.
Bracteolæ; little bracts.
Bracts, 252.
Branchlets; small branches.
Branch, 170.
Bristles; rigid hairs.
Bud, 20, 22. 165—169.
Bulb, 178.
Bulbiferous, 178, *c*.
Bulblets, 178, *c*.
Bulbous; having bulbs.

Caducous, 98.
Cæspitose; turfy, growing in tufts.
Calycine; of a calyx.
Calyculated; having bracteoles resembling an external or additional calyx.
Calyptra; (an extinguisher) applied to the cover of the theca of some mosses.
Calyx, 55, 95.
Cambium, 207.
Campanulate, 104, 1.
Campylotropous; denotes that the ovule is curved upon itself.
Canaliculate; channelled, or furrowed.
Canescent; hoary, approaching to white.
Capillary; very slender, hair-like.
Capitate; growing in a head.
Capsule, 116, 1.
Carina, 105, 5. Carinate, keel-shaped.
Caryopsis; a small, 1-celled, indehiscent pericarp, adhering to the seed which it encloses, as in the grasses. 116, 8.
Carpels, 77.
Carpophore; the axis of the fruit in the Umbelliferæ.
Cartilaginous; gristly.
Caryophyllaceous, 105, 4.
Cathartic; purgative.
Catkin, 299.
Caudate; with a tail-like appendage.
Caudex, 142, *a*.
Caulescent, 184.
Cauline, 220.
Caulis, 184.
Cellular; composed of cells.
Cellular tissue, 29.
Cellulares, 47.
Cernuous; nodding.
Chaffy; with chaff like processes.
Chalaza, 91.
Chemical basis of vegetable tissue, 28.
Chlorophyll, 215, *a*.
Chromulæ; green coloring-matter or particles.
Ciliæ; hairs like those of the eyelash.
Ciliate, 41, *a*.
Circinate, 217, 7.
Circumscissile, 115, 5.
Cirrhose, 240, 2.
Clavate; club-shaped.
Claw, 102.
Climbers, 187.
Cochleate; resembling the shell of a snail.
Cohering; connected.
Collum, 141.
Columella, 116, *a*.
Colored; not green.
Columnar; formed like columns.
Column; the consolidated stamens and pistils of Orchidaceæ.
Coma, 118, *a*.
Commissure; the inner face of the carpels of Umbelliferæ.
Compound leaves, 238.
Comose; a kind of inflorescence, having a tuft of sessile bracts on the top of it.
Compound leaves; consisting of several leaflets.
Compressed, 222, 1.
Concave; hollow.
Concentric; points or lines at equal distance from a common centre.
Concrete; hardened, or formed into one mass.
Confluent; running into one another.
Conjugate; joined in pairs.
Connate; joined together at the base, 242, 4.
Connectile, 68, *b*.
Connivent; converging.
Conoid; like a cone.
Contorted; 108, 4, twisted.
Convolute, 108, 2.
Convex; rising spherically.
Coral Islands, 12, *c*.
Cordate, 234, 25.
Coriaceous; leathery, thick, and tough.
Corm, 179.
Cornute; horned.
Corolla, 56, 100.
Corona (a crown); the expanded cup-like disk of the Narcissus, &c.
Corymb, 301.
Corymbose; arranged like a corymb.
Costate; ribbed.

Cotyledon, 125.
Cotyledonous plants, 48.
Creeper, 182.
Crenate, 235, 4.
Crenulate, 235, 4.
Crisped, 235, 10.
Cruciform, 105, 1.
Cryptogamia, 325.
Cucullate; hooded, cowled.
Culm, 186, *a*.
Cultivation, effects of, 15.
Cuneate; wedge-shaped.
Cupule; the cup, or involucre, of the acorn, and of all amentaceous plants.
Cuspidate; like the point of a spear. A leaf is cuspidate when suddenly contracted to a point.
Cuticle; the epidermis; scarf-skin.
Cyathiform; cup-shaped; concave.
Cylindraceous; like a cylinder in form.
Cyme, 307. Cymose; arranged like a cyme.

Decandrous; with 10 stamens.
Deciduous, 98.
Declinate; turned towards one side.
Decompound; more than once compounded, as bipinnate, &c.
Decumbent; lying down, or leaning on the ground.
Decurrent, 242, 3.
Decussate; crossing each other at right angles.
Deflexed; bent downwards.
Defoliation, 259.
Dehiscence, 68, *a*, 115.
Deltoid; shaped like the Greek letter Δ.
Dentate, 235, 2.
Denticulate, 235, 2.
Depressed; pressed inward or flattened from above.
Diandrous; with two stamens.
Diadelphous; having the stamens united in 2 sets.
Diaphanous; transparent.
Dichotomous; branching by two equal divisions; forked.
Diclinous; (stamens and pistils) in separate flowers.
Dicotyledonous plants, 127.
Didymous; two united.
Didynamous; having two long stamens and two short ones in the same flower.
Diffuse; wide-spread, scattered.
Digestion, 281.
Digitate, 233, 18.
Digynous; with two pistils.
Diœcious; bearing staminate flowers on one individual, and pistillate on another.
Discoid; in the Compositæ, when the flowers are all tubular in the same head.
Disk, 107, *b*; also, the centre of a head in the Compositæ.
Dissected; cut into 2 parts.
Dissepiment; the partitions by which the cells of the pericarp are separated.
Dissemination of seeds, 135.
Distichous; leaves or flowers in two opposite rows.
Distinct, 63, e.
Divaricate; spreading in a straggling manner.
Dodecandrous; having twelve stamens.
Dorsal, 84 (on the back).
Drupe, 116, 6.
Ducts, 33, *f*.
Duramen, 203.

Echinate; beset with prickles.
Elementary organs, 29, &c.
Elliptical, 232, 2.
Elongated; exceeding the common length.
Emarginate, 236, 4.
Embryo, 123, 124, 130.
Emollient; softening.
Endocarp, 112.
Endogenous structure, 210, 211.
Endogens, 126, 197, 328.
Endopleura, 118.
Endosmose, 158, *a*.
Endostome; inner mouth or perforation.
Ensiform; sword-shaped, two-edged.
Entire, 235, 1.
Epicarp, 112.
Epidermis, 35.
Epigynous, 107, *b*.
Epiphytes, 150, *b*.
Equitant, 217, 1.
Erose, 235, 5.
Esculent; eatable.
Etiolated; blanched or whitened.
Exhalation, 269, 271.
Exogenous structure, 198, 199, &c.
Exogens, 127. 196, 328.
Exosmose, 158, *a*.
Exotic; foreign; not native.
Exserted: projecting or extending out of the flower or sheath.
Exsiccated; dried up.
Exstipulate, 251.
Extrorse, 68, 4.

Fæcula; the nutritious part of wheat and other fruits.
Falcate; sickle-shaped; linear and curved.
Farinaceous; mealy.
Fascicle, 308.
Fasciculated, 146, *a*.
Fastigiate; having a flat or level top.
Favose; deeply pitted.
Feather-veined, 230, 1.
Febrifuge; efficacious against fever.
Fecundation; the act of making fruitful.
Ferruginous; iron-colored; rusty.
Fibrils, 112, *b*, 152.
Fibro-vascular tissue, 260.
Fibrous, 146.
Filament, 67.
Filiform; shaped like a thread.

Fimbriate; fringed.
Fistular or fistulous; tubular.
Flabelliform; fan-shaped.
Flexuous; bent in an undulating manner.
Floating root, 119.
Floral envelopes, or perianth, 54.
Floral leaves, 252.
Florets, 303, *b*.
Flosculous; consisting of many tubular monopetalous flowers, or florets.
Flower, origin of, 24.
" consists of, 53.
" physiological structure of, 106.
" normal structure of, 61, *c*.
Flower-bud, 166.
Foliaceous; having the form of leaves.
Folliele, 116, 5.
Foot-stalks; the stalks of either flowers or leaves.
Foramen, 90.
Fork-veined, 229, 3.
Free, 97.
Free central placenta, 88.
Fringed; having a border like a fringe.
Frond; the leaves of the ferns, palms, &c. have been generally so called.
Fruit, 109, 110.
" growth of, 113.
" ripening of, 114.
" consists of, 111.
Frutescent; shrubby.
Fugacious, 257, 1.
Fungous; of the substance of the Fungi.
Funiculus, 91.
Furcate; forked.
Fusiform, 145.

Galea; (104, 5) the arched upper lip of a labiate flower.
Geminate; doubled.
Genus, 52.
Germ; the old name of the ovary.
Germination, 130—133.
Gibbous; swelled out, protuberant.
Glabrous, 237, 1.
Glands, 44.
Glandular fibre or tissue, 31.
Glaucous; sea green; pale bluish green with a powder or bloom.
Globose; round or spherical.
Glossology, 4.
Glumaceæ, 330.
Glume, 256.
Granular; 147, *b*, formed of grains or covered with grains.
Gregarious; herding together.
Grooved; furrowed or channelled.
Groups, 337.
Gymnosperms, 329.
Gynandrous; having the stamens and styles combined in one body.
Gynœcium, 58.

Hairs, 41.
Hastate, 232, 10.
Habit; the general aspect or external features of a plant, by which it is known at sight.
Head, 303.
Helmet or Galea, 104, 5.
Herb, 164, *c*.
Herbarium, 349, 350.
Heterogamous; flowers not all perfect, some being neutral or pistillate.
Hexandrous; having six stamens.
Hilum, 120.
Hirsute, 41, *a*.
Hispid; rough, with stiff hairs.
Hoary, 237, 5.
Homogamous; flowers all tubular, similar and perfect, as in some of the Compositæ.
Homogeneous; having a uniform nature or composition.
Hooded; curved or hollowed at the end into the form of a hood.
Hot springs, 12, *e*.
Hyaline; crystalline, transparent.
Hybrid; partaking of the nature of two species.
Hypocrateriform, 104, 3.
Hypogynous, 107, *b*.

Imbricate; placed one over another, like the tiles upon a roof, 108, 8.
Incised, 235, 8.
Incrassated; becoming thicker by degrees.
Indehiscent, 115.
Indigenous; native of.
Induplicate, 108, 7.
Incumbent; lying against or across. In the Cruciferæ it denotes that the radicle is applied to the back of one of the cotyledons.
Indusium; the membrane that encloses the theca of ferns.
Inferior, 97.
Inflated; tumid and hollow, blown up like a bladder.
Inflexed; bending inward.
Inflorescence, 285, &c.
" centripetal, 293.
" centrifugal, 294.
Infundibuliform, 104, 2.
Innate, 68, 1.
Inserted into; growing out of.
Integument, 118.
Intercellular passages, 39.
Internode, 172.
Introrse, 69, 4.
Involucel, 254.
Involucre, 254.
Involute, 217, 3.
Irregular; unequal in size or figure.

Keel, 105, 5.
Kidney-shaped, 232, 12 (reniform).

Labellum, 107, *a*.

Labiate, 101, 5.
Laciniate, 233, 20.
Lactescent; milky or juicy.
Lamina, 102.
Lanate; woolly.
Lanceolate, 232, 5.
Lateral; relating to the side.
Latex, 265.
Laticiferous tissue, 31, 207, *c*.
Leaf consists of, 27.
" form of, 231.
" color of, 215.
" margin of, 235.
" surface of, 237.
" functions of, 267.
" duration of, 257.
Leaf-bud, 167.
Leaflets, 239.
Leaves, arrangement of, 218.
Legume, 116, 4.
Leguminous; having legumes.
Lenticular: lens-shaped.
Liber, 205, 206.
Ligneous; woody.
Ligula, or ligule; the membrane at the top of the sheath of grasses, &c.
Ligulate; strap-shaped.
Liliaceous, 105, 3.
Limb, 103.
Linear, 234, 23.
Linnean Classes, 73, 74.
Linnean Orders, 80.
Loculicidal, 115, 1.
Loment; a jointed legume.
Lunate; crescent-shaped.
Lyrate, 232, 14.

Marcescent; withering on the plant.
Marginal; on the margin.
Medulla; pith.
Medullary rays, 204.
Medullary sheath, 200.
Membranous, or membranaceous; with the texture of membrane.
Mericarp; half-fruit.
Mesosperm, 118.
Midrib, 227.
Mineral defined, 9.
Monadelphous; stamens all united.
Monandrous; with one stamen.
Moniliform, 147, *b*.
Monocotyledonous plants, 126.
Monœcious; stamens and pistils apart, in separate flowers on the same plant.
Monopetalæ, 334.
Monopetalous, 101.
Monosepalous, 96.
Mucronate, 236, 6.
Multifid; many-cleft.
Muricate; with hard short points.

Naked ovules, or seeds, 111, *a*.
Napiform, 145, *c*.
Narcotic; producing sleep or torpor.
Natural System, 321.
Nectariferous; producing honey.
Nectary, 107, *a*.
Nerves, 227.
Net-veined, 229.
Nodding; in a drooping position.
Node, 172.
Normal; regular, according to rule.
Normal structure of plants, 61.
" causes of deviation from, 63.
Nucleus, 90.
Nut, 116, 7.

Ob, in composition implies inversion, as obovate, inversely-ovate, &c.
Oblong, 232, 3.
Obovate, 232, 6.
Obvolute; 217, 2.
Obsolete; indistinct, as if worn out.
Obtuse; blunt.
Octandrous; with eight stamens.
Octogynous; with eight styles.
Officinal: used in or belonging to the shops.
Offset, 191.
Oleaginous, oily.
Operculum; the lid to a pyxis, &c.
Opposite, 218, 3.
Orbicular, 232, 1.
Orders, 335.
" names of, 340.
Ordinal; relating to the Orders.
Organic bases, 28.
Organography, 2.
Orthotropous, 121.
Oval, 234, 24.
Ovary, 76, 77.
Ovate; egg-shaped (surface), as a leaf.
Ovoid; egg-formed (solid), as a fruit.
Ovules, 81, 89.

Paleacious, 99, *a*.
Paleæ, 256.
Palmate, 147, *a*.
Panduriform; fiddle-shaped, rounded at the ends, narrow in the middle.
Panicle, 304.
Papilionaceous, 105, 5.
Papillose; producing small glandular excrescences.
Pappus, 99, *a*.
Parasitic; growing upon or nourished by another.
Parallel-veined, 229, 2.
Parenchyma, 29, 261.
Parietal placentæ,
Pectinate; comb-like, with long, narrow segments.
Pedate; when the palmate leaf has the two lateral lobes cut into two or more segments.
Pedicel, 288.
Pedicellate; furnished with a pedicel.
Peduncle, 287, 288.
Pellucid; transparent.
Peltate, 233, 21.

Pendulous; drooping, hanging down.
Pentagonal; with 5 sides and 5 angles.
Pentandrous; with 5 stamens.
Pepo, 116, 13.
Perennial; enduring three years or more.
Perfoliate, 242, 2.
Perianth, 54.
Pericarp, 112.
Perigynous; inserted into the calyx.
Peristome; the rim or border surrounding the orifice of the theca of a moss.
Permanent; same as persistent.
Persistent, 98.
Personate, 104, 5.
Petal, 101.
Petaloid; resembling petals.
Petiolate, 221.
Petiole, 221, 222.
Phænogamia, 46, 325.
Pilose, 99, *a*.
Pinnæ; (wings) the segments of a pinnate leaf.
Pinnate, 240, 1.
Pinnatifid, 232, 15.
Pistil, 58, 75.
" physiological structure of, 83.
" theoretical structure of, 84.
Pistillate; bearing pistils.
Pith, 199.
Placenta, 87.
Plaited, 217, 6.
Plant defined, 10.
Plicate; folded like a fan.
Plumose, 99, *a*.
Plumule, 124, *b*.
Pod; legumes, siliques, &c.
Pollen, 70.
Polyandrous; with many stamens.
Polyadelphous; stamens united in several sets.
Polygamous; having staminate or pistillate and perfect flowers on the same tree.
Polygynous; with many pistils.
Polypetalæ, 334.
Polypetalous, 101.
Polysepalous, 96.
Polyspermous; many-seeded.
Pome, 116, 12.
Pores; apertures of perspiration in the cuticle.
Premorse, 145, *b*.
Prickles, 43.
Primine, 90.
Prismatic; formed like a prism, with 3 or more angles.
Procumbent; trailing on the ground.
Proliferous; forming young plants about the roots.
Prostrate; trailing flat on the ground.
Pubescent, 41, *a*.
Pulp; the soft, juicy, cellular substance found in berries and other fruits.
Pulverulent; powdery.
Punctate, 237, 10.
Pungent; stinging or pricking.
Putamen, 112.
Pyriform; pear-shaped.
Pyxis, 116, 11.

Quinate, 241, 9.
Quincuncial, 108, 3.

Raceme, 298.
Racemose; resembling a raceme.
Rachis, 290.
Radiate; when the outer flowers of an inflorescence are largest, or furnished with rays.
Radiate-veined, 230, 2.
Radical, 220.
Radicle, 124, *a*.
Ramial, 220.
Ramose, 144.
Raphe, 121.
Raphides, 29, *f*.
Receptacle, 59.
Recurved; bent or curved backwards.
Reflexed; curved backwards and downwards.
Reniform, 232, 12.
Repand, 235, 11.
Respiration, 275—280.
Resupinate; inverted.
Reticulate, 229, 1.
Retrorse; bent backwards.
Retuse, 236, 5.
Revolute, 217, 4.
Rhizoma, 181.
Rhomboid; oval and angular in the middle.
Rib [costa]; ridge caused by projecting veins, &c.
Ringent, 104, 5.
Root, 136—160.
" growth of, 153.
" forms of, 143, &c.
" use of, 154.
" physiological structure of, 151.
Rosaceous, 105, 2.
Rostrate; with a beak.
Rosulate; arranged in a radiant manner, like the petals of a double rose.
Rotate, 104, 4.
Rugose, 237, 9.
Runcinate, 232, 13.
Runner, 185.

Saccate; with a bag or sack.
Sagittate, 232, 11.
Samara, 116, 10.
Sap, 268.
Sapwood, 203.
Sarcocarp, 112.
Scabrous; rough.
Scale; the bracts of the Compositæ.
Scape, 186, 289.
Scarious; dry, colorless, membranaceous.
Scorpoid; when racemes are revolute before expansion, as Drosera, &c.

Scattered, 218, 1.
Secund; turned to one side.
Secundine, 90.
Scrobiculate; pitted or furrowed.
Seed, 117, &c.
" vitality of, 134.
Segments; parts or divisions.
Seminal; of the seed.
Sepals, 96.
Septicidal, 115, 2.
Septifragal, 115, 3.
Septinate, 241, 10.
Septum; a partition.
Sericeous, 41, *a*.
Serrate, 235, 3.
Serrulate, 235, 3.
Sessile, 221.
Setaceous, or setose; bristly.
Setose, 99, *a*.
Sheath; the lower part of the leaf or leaf-stalk which surrounds the stem.
Shrub, 164, *b*.
Silicle, 116, 3.
Silique, 116, 2.
Sinuate, 232, 16.
Sinus; the recesses formed by the lobes of leaves, &c.
Soporific; inducing sleep.
Sori; the patches of fructification on the back of the fronds of ferns.
Spadix, 300.
Spathe; the sheath surrounding a spadix or a single flower.
Spathulate; obovate, with the lower end much narrowed and tapering.
Species, 50.
Specific names, 342.
Spermoderm; skin of a seed.
Spike, 297.
Spines, 171.
Spinous, 235, 7.
Spiral vessels, 33, *a*.
Spongioles, 142, *c*.
Spores, 129.
Sporogens, 327.
Sporules or spores, 129.
Spur, 107, *a*.
Stamens, 57, 65, 73.
" consist of, 66.
" and pistils, use of, 92.
Staminate; with stamens only, barren.
Standard; same as vexillum or banner.
Stellate, 242, 5.
Stem, 161.
" functions of, 208, 209.
Sterile; barren, unfruitful.
Sternutatory; exciting to sneezing.
Stigma, 79.
Stings, 42.
Stipe; the stalk of a pod, of a fungus, &c.
Stipels, 251.
Stipitate, borne on a stipe.
Stipules, 249.
Stipulate, 251.
Stolon, 192.
Stoloniferous; bearing stolons.
Stomata, 37, 38, 39.
Straight-veined; where the principal veins pass direct to the margin.
Striæ; small streaks, channels or furrows.
Striate; with striæ, slightly furrowed, &c.
Strigose; clothed with short, stiff, and appressed hairs.
Strobile, 116, 15.
Style, 78.
Stylopodium; a kind of disk which is epigynous and confluent with the style.
Sub; in composition, it denotes a lower degree of the quality, as sub-sessile, nearly sessile, &c.
Submersed; under water.
Subulate; awl-shaped.
Succulent; thick, juicy, and fleshy.
Suffrutescent; somewhat shrubby.
Suffruticose; same as the last.
Sulcate; furrowed or grooved.
Superior, 97.
Suture, 84.
Symmetrical, 61, *c*.
Syncarpous; when the fruit consists of united carpels.
Syngenesious; when the anthers are united into a tube, as in Compositæ.
Systematic botany, 310.

Tap root, 145, *c*.
Tendril, 187, *a*.
Terete; rounded or cylindric.
Terminal; borne at the summit.
Ternate, 240, 4.
Testa, 118.
Tetradynamous; with 2 short and 4 long stamens.
Tetragynous; with 4 pistils.
Tetrandrous; with 4 stamens.
Thallogens, 331.
Thallus; that part of Lichens which bears the fructification.
Theca; the vessels which contain the sporules of the Cryptogamia.
Thorn, 171.
Throat; the orifice of the tube of the corolla.
Thyrse, 305.
Tomentose, 41, *a*.
Toothed; dentate.
Torose; uneven or undulating on the surface.
Torus; receptacle, 59.
Trailing; creeping or lying on the ground.
Transverse; cross-wise.
Tree, 164, *a*.
Triandrous; with 3 stamens.
Tricuspidate; having three points.
Tridentate; three-toothed.
Trifid; three-cleft.
Tripinnate, 239, 6.
Triternate, 239, 8.
Truncate; blunt, as if cut square off.
Trunk, 189.

Tube, 103.
Tuber, 180.
Tuberiferous; bearing tubers.
Tuberous, 147.
Tubular, 103.
Tunicated, 178, *a*.
Turbinate; shaped like a top.
Turgid; swollen.

Umbel, 302, *a*.
Umbellet, 305, *a*.
Umbilicate; depressed in the centre.
Unarmed, 235, 7.
Uncinate; hooked at the end.
Undulate; wavy.
Unquis; the claw, as of a petal.
Unilateral; one-sided.
Utricle, 116, 8.

Valvate, 108, 1.
Valves, 115.
Varieties, 51.
Vascular tissue, 33.
Vasculares, 47.
Vasiform tissue, 32.
Vegetable physiology, 3.
Vegetable kingdom, variety of, 13.
Vegetation, its diffusion, 14, *a*.
Veins, 228.
Veinlets, 228.
Velvety; clothed with a dense, soft pubescence.
Venation, 226.
Ventral, 84.
Vernation, 216.
Verticillaster, 300.
Verticillate, 218, 4.
Vesicular; bladdery.
Vexillary, 108, 6.
Vexillum, 105, 5.
Villose; villous; clothed with long hairs.
Vine, 187.
Viscid; clammy, sticky.
Vittæ; receptacles of secretion in the seed of Umbelliferæ.

Whorled, 175.
Winged, 222, 2.
Wood, 201, 202.
Woody tissue, or fibre, 30.

CLASS-BOOK OF BOTANY.

PART SECOND,

THE FLORA.

PREFACE TO THE TABLES.

The following *analytical tables*, founded upon the artificial arrangement of Linnæus, together with those of the succeeding pages under each natural order, are designed and presented simply as a mode of botanic analysis, which is, in some respects, *new* and *improved*. They are the result of much labor and investigation, since each character employed, required a previous examination of all the species included under it. They reduce the process of analysis to a simple series of *dilemmas* or *alternatives*, the decision being, in almost all cases, to be made merely between *two opposite* or *obviously distinct* characters. These decisions or *dilemmas* being, moreover, few in number, conduct the student with absolute precision (provided the tables be free from error and the specimen a good one), to the order or genus to which his plant belongs, by once reading across the page. The advantages thus afforded will be duly appreciated, at least by those who have hitherto been subjected to the drudgery of reading through whole pages of dry generic descriptions, and that too, often, without arriving at any satisfactory conclusion.

In regard to the generic characters employed in the tables, it will be observed that they are drawn from *leaves*, *fruit*, *flower*, or any portion of the plant which suited our convenience, our only inquiry being after those which appear to us the most *obvious* and *constant*. It should be remarked, however, that in many instances, these characters are not strictly applicable to *all* the known species belonging to those particular genera, but only to those which are described in this work, that is, found in New England or New York. In our choice of terms we have always, of necessity, studied the utmost brevity of expression, but have used none but such as are explained in the glossary or in the body of the work.

Although the manner in which these tables are to be used will in general be obvious at a glance, yet it may not be unprofitable to attend to the follow-

ing directions and illustrations. We will suppose the student to be in possession of an unknown plant which he wishes to study by the aid of the Flora, in other words, to analyze. To this end, he first determines to which of the Linnæan classes it belongs, either by his previous knowledge of their characters, or by an appeal to the synopsis, page 3. Thus, he inquires,

1. Has the plant *stamens* and *pistils?* Answer It has.
2. Are they in the *same*, or in *separate* flowers? In the same flower.
3. Are the stamens *free* from the pistils, or *adherent* to them? Free.
4. Are they *distinct* from each other, or *united?* Distinct.
5. Are they of *equal* or *unequal* length? Equal.
6. What is their *number?* Ten. The plant is therefore of the class Decandria. The student now turns to class 10, and inquires,

1. What is the number of *styles?* Two. The artificial order is Digynia.
2. Are the flowers *apetalous*, &c. or *polypetalous*, &c.? Polypetalous.
3. Are the petals *unguiculate* or *not unguiculate?* Unguiculate. The natural order is therefore Caryophyllaceæ. Turn now to natural order 24, and inquire,

1. Is the calyx *tubular*, or *not tubular?* Tubular.
2. What is the *number* of the *styles?* Two.
3. Calyx *with*, or *without* scales at the base? Without. The genus is therefore Saponaria. Turn lastly to the 9th genus, and learn the species in the usual way.

Again, suppose that by the synopsis, page 3, his plant is ascertained to belong to class 12, Icosandria; by reference to that class he learns its artificial order to be Polyandria, corresponding with natural order 49, Rosaceæ. Turning to that order he inquires, with the conspectus before him,

1. Is the fruit *achenia*, *follicles*, *drupes* or *pomes?* Achenia.
2. Are the achenia *naked*, or *enclosed*, &c.? Naked.
3.—*Dry*, or *drupaceous*, &c.? Dry.
4. Is their number 3—*many*, or *only* 1—2? 3—many.
5.—On a *dry* receptacle, or a *juicy* one? Dry.
6.—*Caudate* with the *persistent* styles, or are the styles *deciduous?* Deciduous.
7. Are the leaves *compound*, or *simple?* Compound.
8. Is the plant *caulescent*, or *acaulescent?* Acaulescent, and the genus is Waldsteinia. Turn lastly to that genus and study the species. Further illustrations are, perhaps, unnecessary.

SYNOPSIS

OF THE LINNEAN ARTIFICIAL CLASSES.

PLANTS having	stamens and pistils	on the same flower,	stamens separate from the pistils,			1 stamen.	MONANDRIA. 1
						2 stamens.	DIANDRIA. 2
						3 stamens.	TRIANDRIA. 3
						4 stamens.	TETRANDRIA. 4
						5 stamens.	PENTANDRIA. 5
						6 stamens.	HEXANDRIA. 6
						7 stamens.	HEPTANDRIA. 7
						8 stamens.	OCTANDRIA. 8
						9 stamens.	ENNEANDRIA. 9
						10 stamens.	DECANDRIA. 10
						11 stamens.	DODECANDRIA. 11
						20 or more stamens on the calyx.	ICOSANDRIA. 12
				connected with each other and of	equal length.	20 or more stamens not on the calyx.	POLYANDRIA. 13
					unequal length.	2 long and 2 short.	DIDYNAMIA. 14
						2 long and 4 short.	TETRADYNAMIA 15
				connected with each other	by their filam'ts	in one set.	MONADELPHIA. 16
						in two sets.	DIADELPHIA. 17
						in more than two sets.	POLYADELPHIA. 18
					by their anthers.		SYNGENESIA. 19
			stamens adherent to the pistils.				GYNANDRIA. 20
		in separate flowers,	on the same plant.				MONŒCIA. 21
			on different plants.				DIŒCIA. 22
			on the same or on two or three different plants with perfect flowers intermixed.				POLYGAMIA. 23
	neither stamens or pistils.						CRYPTOGAMIA. 24

CLASS FIRST. MONANDRIA.

Stamen 1.

MONOGYNIA.	Flowers apetalous.	Leafless. Stem branching. Calyx ventricose.	*Salicornia.*	108
		Leaves verticillate. Stem simple.	*Hippuris.*	56
	Flowers complete, spathaceous. Filament petaloid. Endogenous.		*Canna.*	141
DIGYNIA.	Flowers apetalous.	Calyx with 2 sepals. Seeds 4.	*Callitriche.*	121
		Calyx 3-parted. Seed 1.	*Blitum*	108

CLASS SECOND. DIANDRIA.

Stamens 2

Monogynia.	Ovary superior.	Corolla irregular.	Ovary 2-celled.	Calyx not much imbricated.	Trees.	*Catalpa.* 89
				Calyx much imbricated.	Herbs.	Scrophulariaceæ. 92
			Ovary 1-celled, placentæ central and free.		Aquatic herbs.	*Justicia.* 91
			Seeds in a capsule.			Lentibulaceæ. 87
			Seeds naked (111, *a*,) or 4 achenia at the bottom of the calyx.			Labiatæ. 94
		Corolla regular.	4-parted, valvate in æstivation.			Oleaceæ. 106
			5—8-parted, imbricate in æstivation.			*Jasminum.* 105
	Ovary inferior.	Corolla 2-petaled.	Herbs with opposite leaves.			*Circæa.* 56
Digynia.	Endogenous.	Perianth glumaceous.	Grassy herbs.			*Anthoxanthum.* 161

CLASS THIRD. TRIANDRIA.

Stamens 3.

Monogynia.	Endogens.	Flowers aglumaceous.	Ovary superior. Tube of the corolla very long and slender.	*Schollera.* 154
			Ovary inferior. Perianth in 2 rows, 6-parted.	Iridaceæ. 150
		Flowers glumaceous	wholly, solitary, axillary. Stems mostly solid.	Cyperaceæ. 160
			partly, the inner row petaloid. Carpels many-seeded.	*Xyris.* 158
	Exogens.	Flowers monopetalous.	Corolla tubular. Stamens distinct. Ovaries with 1 perfect cell.	Valerianaceæ. 74
Digynia.	Endogens.	Flowers glumaceous, in little spikelets.	Anthers versatile. Stems (185, *a*) hollow.	Gramineæ. 161
Trigynia.	Ovary superior.	Petals 3, inconspicuous.	Capsules 3-celled, few-seeded. Erect.	*Lechea.* 20
		Petals 0.	Capsules 3-celled, many-seeded. Stems prostrate.	*Mollugo.* 24
	Ovary inferior.	Petals 0.	Calyx tube 3-sided, limb 3-parted. Aquatic herbs.	*Proserpinaca.* 56

CLASS FOURTH. TETRANDRIA.

Stamens 4.

Monogynia.	Ovary superior.	Monopetalous.	Capsule 2-celled.	Corolla tube swollen. Border reflected. Stamens very long.	*Plantago.* 85
				Corolla sub-companulate, tube globose, lateral segments subulate.	*Exacum.* 102
			Capsule 1-celled.	Corolla tubular. throat closed by bearded filaments.	*Lycium.* 101
			Stem square, twisted, branching.		*Centaurella.* 102
		Polypetalous (petals often 0).	Calyx companulate, 8-toothed, the teeth alternately smaller.		*Ammannia.* 53
		Apetalous.	Endogenous. Flowers on a spadix. Odor fetid.		*Symplocarpus.* 136
			Exogenous. Calyx 4-parted, with bracts at base.		*Sanguisorba.* 48
	Ovary inferior.	Monopetalous.	Ovary 2 or 3-celled.		Rubiaceæ. 73
			Ovary 1-celled, 1-seeded.		Dipsaceæ. 75
		Polypetalous or apetalous.	Herbs. Fruit a capsule. Calyx tubular.		*Ludwigia.* 56
			Shrubs (one species herbacious). Fruit a baccate drupe.		*Cornus.* 70
Digynia.	Herbs.	Flowers small, axillary, of 2 or 3 petals.	Capsules 2—5-celled.		*Elatine.* 26
	Shrubs.	Flowers with 4 linear and very long petals.	Capsules 2-celled.		*Hamamelis.* 67
Tetragynia.	Polypetalous herbs.	Carpels follicular, distinct. Aquatic. Leaves small.			*Tillæa.* 65
		Carpels united into a many-seeded capsule. Leaves long, linear.			*Sagina.* 24
	Monopetalous shrubs.	Exogenous. Leaves coriaceous. Fruit drupaceous.			Aquifoliaceæ. 80
	Apetalous herbs.	Endogenous. Aquatic. Stipules sheathing. Flowers minute.			Naidaceæ. 139

CLASS FIFTH. PENTANDRIA.

Stamens 5.

- MONOGYNIA.
  - Polypetalous...
    - Flowers inferior,
      - regular.....
        - Stamens opposite to the petals.
          - Shrubs.
            - Stem often thorny. Calyx 4—5-cleft. RHAMNACEÆ. 47
            - Stem climbing. Calyx sub-entire. VITACEÆ. 42
          - Small fleshy herbs. Calyx 2-sepaled. *Claytonia.* 25
        - Stamens alternate with the petals. Shrubs. CELASTRACEÆ. 46
      - irregular. Herbs.....
        - Sepals nearly equal, green. Stipulate. VIOLACEÆ. 18
        - Sepals unequal, colored. Exstipulate. *Impatiens.* 29
    - Flowers superior. Shrubs.....
      - Leaves evergreen. Calyx not extending above the ovary. *Hedera.* 69
      - Leaves deciduous. Calyx extending above the ovary. *Ribes.* 61
  - Monopetalous.
    - Fls. inferior.
      - Corolla regular.
        - Herbs (rarely shrubby).
          - Sta. alternate with petals.
            - Fr., capsule or berry.
              - Cells with many seeds.
                - cells 2. Æst. plicate. SOLANACEÆ. 101
                - cells 3. Æst. imbricate. POLEMONIACEÆ. 98
                - Corolla limb 5-parted. *Phlox.* 98
                - Corolla limb entire. CONVOLVULACEÆ. 100
              - Cells with 1 or 2 seeds.
                - many seeded. GENTIANACEÆ. 102
                - 1 or 2-seeded. *Hydrophyllum.* 96
            - Capsule 1-celled, ...
              - Fruit 4 naked achenia (111, *a*). Leaves rough. BORAGINACEÆ. 95
          - Stemens opposite the segments of the corolla. Fruit a capsule. PRIMULACEÆ. 84
        - Low shrubs, prostrate, with crowded, evergreen leaves. *Diapensia.* 99
      - Corolla irregular,
        - tubular. Stamens declined, very long, smooth. Shrubs. ERICACEÆ. 79
        - rotate. Stamens declined, hairy. Capsules 2-celled. Herbs. *Verbascum.* 92
    - Fls. supe'or.
      - Capsule .....
        - 2 or more-celled.....
          - Herbs.....
            - Corolla regular. *Campanula.* 78
            - Corolla irregular. *Lobelia.* 77
          - Beautiful shrubs. *Portlandia.* 73
        - 1-celled. Smooth aquatic herbs. *Samolus.* 84
      - Seeds in a drupe or berry. Shrubs with opposite leaves. CAPRIFOLIACEÆ. 72
  - Apetalous.....
    - Flowers inferior.
      - Capsule 1-celled, 5-seeded. Salt-marsh herbs. *Glaux.* 84
      - Capsules utricular, 1-seeded. Slender herbs. *Anychia.* 23
    - Flowers superior. Calyx tubular, campanulate. Ovary 1-celled. *Comandra.* 115
- DIGYNIA....
  - Monopetalous..
    - Stamens inserted on the pistil,
      - distinct. Leaves opposite. Juice milky. APOCYNACEÆ. 103
      - consolidated with it. Juice milky. *Asclepias.* 104
    - Stamens inserted on corolla.
      - Leaves opposite. Juice watery. Capsule 1-celled. *Gentiana.* 102
      - Leafless, twining, parasitic. *Cuscuta.* 100
  - Polypetalous...
    - Seeds two. Flowers in umbels. Herbs with hollow stems. UMBELLIFERÆ. 68
    - Seeds numerous. Herbs with flowers in thyrsoid panicles. *Heuchera.* 66
  - Apetalous.....
    - Herbs. Fruit an utricle. CHENOPODIACEÆ. 108
    - Trees. Fruit a samara. *Ulmus.* 118
- TRIGYNIA...
  - Flowers inferior.
    - Leaves opposite and.....
      - very minute. Flowers solitary. *Sarothra.* 21
      - large, ternate. Flowers racemose. *Staphylea.* 46
    - Leaves alternate. Shrubs. Berry one-seeded. *Rhus.* 34
  - Flowers superior. Corolla rotate or urn-shaped. Shrubs, with opposite leaves. CAPRIFOLIACEÆ. 72
- TETRAGYNIA. Smooth, perennial herbs. Leaves mostly radical. *Parnassia.* 19
- PENTAGYNIA.
  - Calyx inferior...
    - Leaves radical,.....
      - with glandular hairs. *Drosera.* 19
      - smooth, ovary one-seeded. *Statice.* 86
    - Leaves cauline. Ovary 5—10-celled, 10-seeded. *Linum.* 26
  - Calyx superior. Flowers umbelled. Berry 5-seeded. *Aralia.* 69

CLASS SIXTH. HEXANDRIA.

Stamens 6.

Monogynia.	Endogens.	Ovary superior.	Flowers not spadaceous.	Calyx green, petals large, colored.	*Tradescantia.*	157
				Flowers somewhat glumaceous.	Juncaceæ.	156
				Calyx and corolla distinct, equal, both petaloid. Cells of ovary 1-seeded.	*Pontederia.*	154
				Calyx and corolla distinct, equal, both petaloid. Ovary many-seeded.	Liliaceæ.	153
			Flowers on a spadix.		Araceæ.	136
		Ovary inferior.			Amaryllidaceæ.	148
			Petals 6, opposite the 6 sepals, appendaged inside.		Berberidaceæ.	6
			Petals 3, alternate with the 3 sepals. Aquatic herbs.		*Flœrkea.*	30
	Exogens.	Polypetalous...			*Prinos.*	80
		Monopetalous.			*Oryza.*	161
Digynia.	Perianth glumaceous.					
Trigynia....	Endogens.	Calyx and corolla similarly developed.	Flowers conspicuous, mostly colored. Ovary many-seeded.		Melanthaceæ.	155
			Fls. inconspicuous. Lvs. ensiform. Bog herbs. Tribe *Juncagineæ* of		Alismaceæ.	140
	Exogens.	Stems sheathed immediately above the insertion of the leaves.			*Rumex.*	112

CLASS SEVENTH. HEPTANDRIA.

Stamens 7.

Monogynia. Monopetalous. Low herbs. Leaves in a single whorl. Corolla 7-parted.	*Trientalis.*	84
Monogynia. Polypetalous. Trees with digitate leaves. Flowers thyrsoid.	*Æsculus.*	44
Tetragynia. Apetalous, Flowers spiked or racemed. Aquatic herbs.	*Saururus.*	119

CLASS EIGHTH. OCTANDRIA.

Stamens 8.

Monogynia.	Polypetalous.	Ovary superior.	Petals 4—5.	Calyx green, regular.	*Rhexia.*	52
				Calyx colored, spurred.	*Tropæolum.*	29
			Petals 8. Capsules opening across.		*Jeffersonia.*	6
		Ovary inferior. Petals 4. Capsule 4-celled.			Onograceæ.	56
	Monopetalous.	Ovary inferior. Fruit baccate. Tribe *Vaccineæ*, of			Ericaceæ.	79
	Apetalous.	Ovary superior. Fruit a 1-seeded drupe. Shrubs.			Thymeliaceæ.	116
Digynia.	Apetalous, Calyx scarcely colored. Ovary inferior. Herbs.				*Chrysosplenium.*	66
Trigynia.	Apetalous. Calyx colored. Stem with stipular sheathes above the leaves.				*Polygonum.*	112

CLASS NINTH. ENNEANDRIA.

Stamens 9.

Monogynia. Shrubs with alternate, entire leaves. Calyx green, in two series.	*Laurus.* 114
Digynia. Herbs, with alternate leaves and stipular sheaths. Calyx colored.	*Rheum.* 112

CLASS TENTH. DECANDRIA.

Stamens 10.

MONOGYNIA..	Fruit not a legume	Leaves not sensitive.	Petals present, or if not, the plants have no green herbage.	ERICACEÆ. 79
			Petals 0. Calyx with five horn-like processes.	*Decodon.* 53
		Leaves sensitive, radical, closing when touched.		*Dionæa.* 19
	Fruit a legume. Ovary single and simple.			LEGUMINOSÆ. 49
DIGYNIA. . . .	Polypetalous. Seeds numerous.		Petals with long claws. Calyx tube cylindric.	CARIOPHYLLACEÆ. 24
			Petals with short claws, or with 0. Capsules two-beaked.	SAXIFRAGACEÆ. 66
	Apetalous. Seeds 1—2, included in the calyx. Stamens inserted on the calyx.			*Scleranthus.* 109
TRIGYNIA.	Herbs, with swelling joints, opposite, entire leaves, and regular, 5-petaled flowers.			CARIOPHYLLACEÆ. 24
PENTAGYNIA.	Leaves opposite, cauline and . . .	stipulate with minute stipules.		*Spergula.* 23
		exstipulate. Flowers regular.		CARIOPHYLLACEÆ. 24
	Leaves alternate or radical, . . .	compound. Stamens united at base.		*Oxalis.* 31
		simple. Stamens distinct.		CRASSULACEÆ. 65
DECAGYNIA.	Apetalous. Calyx petaloid, 5-sepaled. Fruit a 10-seeded berry.			*Phytolacca.* 113

CLASS ELEVENTH. DODECANDRIA.

Stamens 12 *to* 19.

MONOGYNIA.	Polypetalous.	Calyx of two slightly united sepals. Prostrate, fleshy herbs.	*Portulaca.* 25
		Calyx of twelve segments. Stems erect.	*Lythrum.* 53
	Apetalous. Calyx with three (or four) segments. Acaulescent herbs. Leaves two.		*Asarum.* 107
DIGYNIA.	Stamens and petals inserted on a ring in the throat of the calyx. (Fruit hispid.)		*Agrimonia.* 48
TRIGYNIA....	Monœcious. Calyx-like involucel, enclosing several staminate (monandrous) flowers with one pistillate flower.		*Euphorbia.* 123
	Flowers perfect. Calyx 4—6-sepaled. Petals palmate. Stamens inserted upon a glandular disk.		*Reseda.* 16
DODECAGYNIA.	Calyx 12-parted. Corolla 12-petaled. Carpels 12. Succulent herbs.		*Sempervivum.* 65

CLASS TWELFTH. ICOSANDRIA.

Stamens 20 *or more, arising from the calyx (perigynous).*

MONOGYNIA, DI-PENTAGYNIA & POLYGYNIA.	Leaves opposite,	not succulent.	Ovary partly free (half-superior), 4-celled.	*Philadelphus.* 66
			Ovary adherent (inferior). Leaves punctate.	MYRTACEÆ. 51
		succulent. Petals numerous, in many rows.		MESEMBRYANTHEMACEÆ. 63
	Leaves alternate. Styles one—many. Ovary free or adherent.			ROSACEÆ. 48
	Leafless, succulent, spiny. Ovary adherent to the calyx. Styles united.			CACTACEÆ. 62

CLASS THIRTEENTH. POLYANDRIA.

Stamens 20 or more, arising from the receptacle (hypogynous).

Monogynia.	Ovaries compound.	Placentæ parietal.	Sepals 2 (or 3). Juice colored (except in the exotic Chryseis).	Papaveraceæ. 12
			Sepals 5, the two outer small. Petals fugaceous.	Cistaceæ. 20
		Placentæ in the axis.	Stigma peltate, petaloid. Leaves hollow (*ascidia*). Herbs.	*Sarracenia.* 11
			Stigma small. Peduncle on a membranaceous bract. Trees.	*Tilia.* 39
		Placentæ occupying the whole surface of the dissepiment.	Stigma radiate.	Nymphaeceæ. 10
	Ovary simple.	Calyx 4—5 sepaled.	Leaves ternately divided. Flowers racemose.	Ranunculaceæ. 1
		Calyx 3-sepaled.	Leaves often peltate. Flower solitary.	*Podophyllum.* 6
Di-pentagynia and Polygynia.	Leaves never peltate.		Herbs, with acrid, colorless juice.	Ranunculaceæ. 1
			Trees, with large, showy flowers.	Magnoliaceæ. 2
	Leaves centrally peltate.		Torus turbinate, the ovaries in pits.	*Nelumbium.* 9
			Torus inconspicuous. Styles many.	*Brasenia.* 7

CLASS FOURTEENTH. DIDYNAMIA.

Stamens 4, two of them longer than the other two.

Gymnospermia. (Seeds naked; 111, *a.*)	Achenia 4 (or fewer), included in the calyx. Corolla monopetalous and labiate.			Labiatæ. 94
Angiospermia. (Seeds in a pericarp.)	Calyx inferior.	Herbs.	Seeds many.	Calyx imbricate in æstivation.	Scrophulariaceæ. 92
				Calyx sub-valvate in æstivation.	Pedaliaceæ. 90
			Herbage green. Seeds 4 or 1. Inflorescence spicate.	Verbenaceæ. 93
			Herbage white or light brown.	Orobanchaceæ. 88
		Twining shrubs, with showy, ventricose corollas.		*Bignonia.* 89
	Calyx superior.	Peduncles 2-flowered. Trailing evergreen.		*Linnæa.* 72

CLASS FIFTEENTH. TETRADYNAMIA.

Stamens 6, four of them longer than the other two.

Siliquosa and Siliculosa.	Petals 4, equal cruciate. Pod 2-celled by a false partition.	Cruciferæ. 14
	Petals 4, unequal, not cruciate. Torus with one gland. Stamens 8—32.	*Polanisia.* 45

CLASS SIXTEENTH. MONADELPHIA.

Stamens united by their filaments into one set.

TRIANDRIA.	Endogenous herbs, with spathaceous bracts. Anthers turned outward.	IRIDACEÆ.	150
PENTANDRIA.	Shrubby plants, climbing by tendrils. Calyx with a filamentous crown.	*Passiflora.*	59
	Shrubby plants, without tendrils. Filaments 10, 5 of them without anthers.	*Erodium.*	28
HEPTANDRIA.	Corolla 5-petaled, irregular. Filaments 10, three of them without anthers.	*Pelargonium.*	28
DECANDRIA.	Fruit a legume. Corolla mostly papilionaceous.	LEGUMINOSÆ.	49
	Fruit of five distinct carpels, which separate from the axis, &c.	*Geranium.*	28
POLYANDRIA.	Calyx valvate in æstivation, generally double. Herbs.	MALVACEÆ.	38
	Calyx imbricate in æstivation. Trees.	TERNSTRÆMIACEÆ.	37

CLASS SEVENTEENTH. DIADELPHIA.

Stamens united by their filaments, forming two sets.

HEXANDRIA.	Petals 4, one or two of which are saccate or spurred at their base.	FUMARIACEÆ.	13
OCTANDRIA.	Petals 3, the lowest one carinate. Sepals five, two of them winged and colored.	POLYGALACEÆ.	17
DECANDRIA.	Flowers generally papilionaceous. Fruit a legume.	LEGUMINOSÆ.	49

CLASS EIGHTEENTH. POLYADELPHIA.

Stamens united by their filamens into more than two sets.

POLYANDRIA.	Leaves opposite, punctate. Flowers yellow. Fruit a membranaceous capsule.	*Hypericum.*	21
	Leaves alternate, punctate. Flowers white. Fruit a berry, with a leathery rind.	*Citrus.*	36

CLASS NINETEENTH. SYNGENESIA.

Stamens 5, cohering by the tips of their anthers.

	Herbaceous plants. Flowers or florets collected into dense heads (compound flowers). Corollas monopetalous of various forms.	COMPOSITÆ.	76

CLASS TWENTIETH. GYNANDRIA.

Stamens and style consolidated.

MONANDRIA & DIANDRIA.	Endogens. Herbs of grotesque and often beautiful forms, with corollas peculiarly irregular, and consisting of a perianth of 6 parts. Seeds numerous, small. .	ORCHIDACEÆ.	143
TRIANDRIA.	Exogens. Herbs or shrubs. Flowers greenish. Stamens 6 to 12. Stigmas radiate, ...	ARISTOLOCHIACEÆ.	107

CLASSES TWENTY-FIRST, TWENTY-SECOND and TWENTY-THIRD. MONŒCIA, DIŒCIA and POLYGAMIA.

21. *Stamens apart from the pistils in different flowers upon the same plant.*
22. *Stamens apart from the pistils in different flowers upon different plants.*
23. *Stamens apart from the pistils in some flowers, united in others on the same or on two or three different individual plants.*

TREES.	Angiospermous Exogens.	Polygamous.	Perfect and imperfect flowers on different plants and	dissimilar.	Leaves pinnate. Lvs. simple.	Apetalous. Fruit a samara, 2-winged.	*Negundo.*	43
						Polypetalous. Fruit a legume.	*Gleditschia.*	49
						Receptacle fleshy and turbinate. Juice milky.	*Ficus.*	132
						Recep. minute. Perfect fls. with twice as many sta. as imperf.	*Nyssa.*	115
				similar.	Corolla 0.	Branches and petioles prickly. Stamens more than 2.	*Xanthoxylon.*	33
					Corolla 0; or if present, polypetalous.	Stamens 2. Pistils 1.	*Fraxinus.*	106
					Corolla urceolate, 4—6-parted.	Stamens more than 2.	*Diospyros.*	81
			Perfect and imperfect fls. on the same plant.		Fruit a globular drupe.	Leaves not lobed.	*Celtis.*	118
					Fr. a samara, 2-winged.	Lvs. opposite, lobed. Fls. regular.	*Acer.*	43
		Monœcious.	Fruit a nut or a 2-celled and few-seeded capsule.		Aments globose.	Leaves palmately lobed.	*Platanus.*	131
					Aments conic.	Lvs. palmately lobed. Stip. deciduous.	*Liquidambar.*	130
			Fruit drupaceous (§ 116, 6), 1-celled, with imperfect partitions.			Leaves pinnated, exstipulate.	JUGLANDACEÆ.	125
			Fruit a nut (acorn § 116, 7) bony or coriaceous, and more or less enclosed by a cupule.			Leaves simple.	CUPULIFERÆ.	126
			Fruit membranaceous, by abortion 1-celled, indehiscent.			Leaves simple. Stipules deciduous.	BETULACEÆ.	127
		Diœcious.	Apetalous; stamens 1—6, flowers in an ament.			Seeds numerous, silky. Leaves simple, stipulate.	SALICACEÆ.	129
			Polypetalous; stamens 10, flowers in racemes.			Fruit a legume. Leaves decompound, very large.	*Gymnocladus.*	49
	Gymnospemous Exogens.		Flowers monœcious, usually in a cone.			Leaves acerose and squamiform.	CONIFERÆ.	133
SHRUBS.	Angiospermous Exogens.	Diœcious.	Ovary 1-seeded.	Not parasitic.	Stamens 1—6.	Stigmas 2. Leaves punctate with resinous glands.	*Myrica.*	128
					Stamens 8.	Style 1. Leaves and shoots scurfy. Calyx succulent.	*Shepherdia.*	117
				Parasitic.	Fertile flowers, with 4 minute petals.	Anth. sessile, adhering to the calyx.	*Viscum.*	71
			Ovary many-sd.	Fruit a berry.	Inflorescence axillary (not amentaceous).	Seeds bony.	*Empetrum.*	124
				Fruit capsular.	Inflorescence an ament.	Seeds (not bony) with an egret-like down.	*Salix.*	129
		Monœcious.	Leaves ovate, serrate or crenate.			Flowers in aments. Leaves simple. Stipules deciduous.	BETULACEÆ.	127
			Leaves sinuate-pinnatifid.			Flowers in aments. Plant aromatic, with pinnatifid-lobed leaves.	*Comptonia.*	128
			Leaves stipulate.			Fruit baccate. Shrubs or small trees, with milky juice.	*Morus.*	132
		Polygamous.	Leaves exstipulate.			Fruit a samara. Flowers regular, in racemes, corymbs, &c.	*Acer.*	43
	Gymnospermous Exogens.		Flowers diœcious.			Fruit an imperfect drupe or berry. Lvs. opposite or verticillate, scale-like or accrose.	CONIFERÆ.	133

Herbs.	Exogens.	Monœcious.	Fls. similar. Stamin. flower apetalous.	4-parted; pistillate calyx 2-sepaled. *Urtica.*	132
				3-parted; pistillate calyx 5-parted. *Tragia.*	123
			Cal. 3—5-parted, not colored, colored, retaining its colors when dry. *Amaranthus.*		110
			Calyx wanting. No floral envelops in either kind of flower. *Podostemon.*		122
			Calyx many-parted. Stamens 16—20. Pistillate calyx 6-parted. *Ceratophyllum.*		8
			Staminate flower with a polypetalous cor.	Stamens numerous. Anthers aggregate. *Begonia.*	83
				Petals 4. Stamens 4—8. *Myriophyllum.*	56
				Petals 5—6, partially united. Sta. 5, polyadelphous. CUCURBITACEÆ.	60
			Fls. similar. Staminate flower with a monopetalous cor.	Calyx 4-sepaled. Stamens 30—40. *Poterium.*	48
				Calyx 1-sepaled or imbricated. Stamens 5. COMPOSITÆ.	76
		Flowers dissimilar. The only floral envelop is the 4-parted calyx of the staminate flower. *Bœhmeria.*			132
		Diœcious.	Fruit a utricle or achenia. Styles 2. Leaves rough, (often with stings,) stipulate. Flowers inconspicuous. URTICACEÆ.		132
				Styles 3—4. Leaves without stipules. Weedy herbs, with small flowers. CHENOPODIACEÆ.	108
			Fruit a drupe. Stamens more than 10. Leaves peltate. Climbing, suffruticose plants. Racemes axillary. *Menispermum.*		5
		Polygamous.	Flowers apetalous, Perfect flowers with a 4-cleft calyx. Sta. elastic. Pistillate flower with a 2-sepaled cal. *Parietaria.*		132
				Perfect flowers with a 5-cleft calyx. Pistillate flower with a 2-parted calyx. *Atriplex.*	108
			Flowers polypetalous. Petals 5. Flowers in an umbel. Stamens 5. Leaves few, ternate or quinate. *Panax.*		69
	Endogens.	Monœcious.	Flowers incomplete, neither glumaceous nor spadicose, on a spadix; spathe wanting. Anthers fixed by their base. Sheathes of leaves entire. CYPERACEÆ.		160
				cauline. Anthers versatile. Sheathes of the leaves split. GRAMINEÆ.	161
				radical. Inflorescence a head, on a slender scape. Aquatic. *Eriocaulon.*	159
				present. Monandrous. Aquatics with cellular leaves. NAIADACEÆ.	139
				Diandrous. Floating aquatics. Roots suspended. *Lemna.*	137
				Sta. more than 3. Root with a fleshy corm or rhizoma. ARACEÆ.	136
			Flowers complete. Calyx 3-sepaled. Corolla 3-petaled. Stamens about 24. Leaves mostly sagittate. *Sagittaria.*		110
		Diœcious.	Flowers not spadaceous, &c. nor aquatic. Fr. a 2-celled capsule. Fls. red. A twining herb with no tendrils. *Dioscorea.*		151
				Fr. a 3-celled ber. Fls. white or greenish. Tend. generally present. *Smilax.*	152
			Flowers on a spadix enclosed in a spathe, on a long and spiral scape. Aquatic with long, linear leaves. *Valisneria.*		141
		Polygamous.	A submersed aquatic, with entire, verticillate leaves. Corolla 3-petaled. Stamens 9, 3 interior. *Udora.*		141
			An erect plant, with large, plaited leaves. Perianth 6-parted, green. Stamens 6. *Veratrum.*		155

CLASS TWENTY-FOURTH. CRYPTOGAMIA.

Plants destitute of true flowers, producing spores instead of seeds.

Acrogens. Plants with a regular axis.	Leaves	distinct, many nerved. Thecæ on the back or edge of the frond.	FILICES.	164
		distinct, one nerved. Thecæ axillary.	LYCOPODIACEÆ.	163
		veiny, confluent into an expansion.	HEPATICÆ.	167
		veinless. Plants entirely cellular.	MUSCI.	165
	Leafless.	Stems jointed and hollow. Partly vascular.	EQUISETACEÆ.	162
		not jointed. Submersed aquatics, wholly cellular.	CHARACEÆ.	166
Thallogens. Plants with no axis.	Aerial,	dry, crustaceous, thallaceous, on trees, rocks, &c.	LICHENES.	168
		succulent, often ephemeral, growing on decaying matter.	FUNGI.	169
	Aquatic,	consisting of simple vessicles or lobed fronds.	ALGÆ.	170

ABBREVIATIONS.

Very few abbreviations or arbitrary characters are used in this work. The impressions made by them upon the mind of the learner, even when well understood, are believed to be less vivid than those conveyed by a full and fair type. Abbreviated words, however, will occasionally be found, but as they are only those of more frequent usage and are simply shortened by the omission of the last letters or syllables, they will occasion little difficulty to the learner. Some of them are as follows;

acc. accumbent.
ach. achenia.
æstiv. æstivation.
alter. alternate.
amplex. amplexicaul.
ann. annual.
anth. anther.
Apr. April.
Aug. August.
axill. axillary.
bien. biennial.
cal. calyx.
cor. corolla.
Dec. December.
decid. deciduous.
dichot. dichotomous.
ell. elliptical.
emarg. emarginate.
epig. epigynous.
Feb. February.
fil. filament.
fl. flower.
fls. flowers.
fr. fruit.
ft. foot.
hd. head. *hds.* heads.
hyp. hypogynous.
imbr. imbricate.
inf. inferior.
invol. involucre.
irreg. irregular.
Jan. January.
Jn. June.
Jl. July.
leg. legume.
lvs. leaves.
lom. loment.
Mar. March.
Nov. November.
Oct. October.
opp. opposite.
ova. ovary.
ped. peduncle.
per perennial.
pet. petal.
perig. perigynous.
recept. receptacle.
reg. regular.
seg. segment.
Sept. September.
sta. stamens.
stig. stigma.
sds. seeds.

It is aside from the design of a work purely elementary like the present, to burden its pages with long lists of synonyms and authorities. Of the former we have introduced only such as have been in more general use among us, and are adopted in such works as those of Torrey, Nuttall, Beck, Bigelow, Eaton, &c. In regard to authorities for specific and generic names, we quote none except where synonyms are introduced, or where we are indebted to coemporary authors of our own country. These names are sometimes quoted in full type; others are abbreviated as follows;

Ait. Aiton.
Bw. Bigelow.
Br. Brown.
Dc. DeCandolle.
Darl. Darlington.
Desf. Desfontaines.
Dew. Dewey.
Ell. Elliot.
Ea. Eaton.
Gn. Gmelin.
Gron. Gronovius.
Hook. Hooker.
Jus. Jussieu.
L. Linnæus.
Lind. Lindley.
Lam. Lamark.
Lec. Le Conte.
L'Her. L'Heretier.
Mœnch. Mœnchausen.
Muh. Muhlenberg.
Mx. or *M.* Michaux.
N. or *Nutt.* Nuttall.
Pers. Persoon.
Poir. Poiret.
P. Pursh.
Raf. Rafinesque.
Rich. Richard.
Spr. Sprengel.
Sw. Swartz.
Sm. Smith.
T. & G. Torrey and Gray.
Tor. Torrey.
W. Willdenow. &c.

FLORA

OF THE

NORTHERN SECTIONS OF THE U. STATES,

PARTICULARLY OF

NEW ENGLAND AND NEW-YORK.

FIRST GRAND DIVISION,

PHÆNOGAMIA OR FLOWERING PLANTS.

Plants consisting of a regular axis of growth with leafy appendages; composed of a cellular, vascular and ligneous structure; developing flowers and producing seeds.

SUBDIVISION FIRST,

EXOGENS OR DICOTYLEDONOUS PLANTS.

STEM composed of distinct bark and pith with an intervening layer of woody fibre and vessels. GROWTH by annual, concentric, external zones or layers. LEAVES mostly with reticulated veins and falling off by an articulation. SEPALS and PETALS in 5s and 4s much oftener than in 3s. EMBRYO with 2 opposite, or several whorled cotyledons.

CLASS I. ANGIOSPERMS.

OVULES produced within an OVARY and fertilized by the pollen through the medium of the PISTIL, becoming SEEDS enclosed in a PERICARP. EMBRYO with two opposite cotyledons.

SUBCLASS I. POLYPETALÆ.

Floral envelops usually consisting of both calyx and corolla, the latter composed of distinct petals.

ORDER I. RANUNCULACEÆ. *The Crowfoot Tribe.*

Calyx—Sepals usually 5, sometimes 3, 4 or 6, mostly deciduous and imbricate in æstivation.
Corolla—Petals 3—15, sometimes 0, hypogynous.
Stamens—Indefinite, numerous, distinct, hypogynous;—*anthers* adnate or innate.
Ovaries—Numerous, rarely solitary or few, seated on the torus.
Fruit—Achenia, baccate or follicular.

A moderately large order of plants, generally herbs, in a few instances climbing. The leaves, which are mostly alternate, are variously divided, with half-clasping petioles. Very few of the genera are found in hot climates.

Properties. Almost all the genera contain an acrid juice highly prejudicial to animal life, but easily decomposed and deprived of its activity by a heat of 212 deg. They also lose their poisonous qualities in drying. This order is rich in ornamental cultivated plants.

Conspectus of the Genera.

Styles	1;	anthers introrse;	racemes ovate or oblong,	*Actæa.*	1
			racemes long, virgate,	*Cimicifuga.*	2
	5;	petals not spurred;	flowers erect,	*Nigella.*	17
		petals spurred, equal;	flowers nodding,	*Aquilegia.*	13
	2—3;	corolla irregular; sepals 5,	upper one spurred at base,	*Delphinium.*	10
			upper one large, vaulted,	*Aconitum.*	14
		corolla regular; fruit follicular,		*Pæonia.*	16
	many;	petals 5—15; fruit achenia;	lvs. entire or palmately div.	*Ranunculus.*	4
			leaves pinnately divided,	*Adonis.*	15
		fruit follicu.;	leaves cauline,	*Trollius.*	12
			leaves radical,	*Coptis.*	11
		petals 0, the calyx colrd.;	involucre calyx-like, near the flower,	*Hepatica.*	7
			involucre leaf-like, distant from the flower,	*Anemone.*	6
			involucre 0; lvs. opposite; stem climbing,	*Clematis.*	5
			lvs. alternate, 2-3-ternate,	*Thalictrum.*	3
			simple,	*Caltha.*	9
			2 only,	*Hydrastis.*	8

1. ACTÆA.

Calyx 4-sepaled, deciduous; petals 4, often wanting; stigma 1; berry 1-celled, many-seeded; seeds hemispherical.

Gr. ακτη, the elder, which plant these herbs resemble in foliage. Cal. inferior, of four circular, obtuse sepals. Pet. oblong, clawed. Fil. about 30, dilated above. Anth. 2-lobed. Ova. ovate. Stig. sessile. Berry globular, smooth, with a lateral furrow. Seeds in two rows.—Perennial herbs with palmately divided leaves.

1. A. RUBRA. *B.* A. Americana, *P.*

Leaves twice and thrice ternate; *raceme* hemispherical; *petals* acute; *pedicels* of the fruit slender; *berries* red, ovate-oblong. Not uncommon in rocky woods, and rarely found in the borders of fields. The stem divides into two branches, one of which usually bears leaves only, the other, leaves and a bunch of flowers. The leaves are irregularly 2 and 3-ternate with leaflets ovate-lanceolate, variously lobed and cut. Petioles lengthened, smooth as well as nearly the whole plant. Raceme of flowers dense, white. Pedicels smallest in their midst. Plant about 2 feet high, slightly glaucous. May. *Red Baneberry.*

2. A. ALBA. *B.* A. Americana, β alba. *P.*

Leaves twice and thrice ternate; *raceme* oblong; *petals* truncate; *pedicels* of the fruit thicker than the peduncle; *berries* white. Resembles the foregoing in foliage and habits, but is readily distinguished by the racemes, which are narrower and much longer, by the thickened pedicels and the milk-white fruit. *White Baneberry.*

2. CIMICI'FUGA.

Calyx 4—5-sepaled; corolla 4—6-petaled, sometimes wanting; follicles 1—8, oblong, many-seeded.

Lat. *cimex*, a bug, *fugo*, to drive away, indicating a certain supposed property of one of the species. Plants herbaceous.

C. RACEMO'SA. *Ells.* Actæa racemosa. *P.*

Leaves ternately decompound; *leaflets* ovate-oblong, cut-dentate; *racemes* very long; *capsules* follicular, dry, dehiscent, ovate; *style* 1. A tall, leafy plant, with the aspect of an Actæa, found in upland woods. Stem 4—8 feet high with long panicled racemes of white sepaled, and monogynous flowers. Petals small, 4—6. Stamens about 100 to each flower, giving the raceme the appearance of a long and slender plume. Flowers very fetid. The Indians use the root to cure the bite of the Rattle-snake. Jn. Jl. Per. *Black Snake-root.*

3. THALI'CTRUM.

Calyx 4—5-sepaled, colored; corolla 0; seeds without awns.

Said to be from θαλλω, to be green. Sepals roundish, concave, deciduous. Fil. numerous, compressed, dilated upwards, longer than calyx. Ovaries superior, numerous. Sty. 0. Stig. many. Achenia ovate.

1. T. DIOI'CUM.

Very smooth; *leaves* decompound; *leoflets* roundish, with obtuse lobes; *filaments* filiform; *flowers* diœcious. Herb 1 or 2 feet high, growing in meadows and woods. Stem striate, jointed. Leaflets paler beneath, with 5 to 7 rounded lobes or teeth. Flowers in long-stalked panicles. Sepals 5, obtuse, purplish. The barren flowers with numerous slender filaments and yellow anthers; the fertile ones smaller, with shorter stamens. Fruit oval, striate. May. Per. *Early Meadow Rue.*

2. T. CORNU'TI. *L.* T. Corynellum. *Dc.*

Flowers polygamous; *filaments* clavate; *fruit* sessile, striate; *leaflets* obtusely 3-lobed, paler underneath. A handsome, herbaceous plant, common in meadows. Stem 3—4 feet high, smooth, hollow, jointed, furrowed. Leaves resembling those of the Columbine (Aquilegia), green above, smooth, several times compounded. Petioles sheathing at base. Panicles large and diffuse. The barren flowers have numerous club-shaped stamens with oblong, yellow anthers. Fertile flowers smaller and less crowded. Jn. Jl. Per. *Meadow Rue.*

3. T. ANEMONOI'DES. *Mx.* Anemone thalictroides. *L.*

Flowers umbeled; *floral leaves* petiolate, simple, whorled, resembling an involucrum; *radical leaves* biternate. Woods and pastures. The root of this little herbaceous plant consists of several oblong tubercles. Stem erect, 6—8 inches high, slender, bearing several flowers at the top in a sort of umbel. Leaves broad-cordate, 3-lobed at the end, on long petioles, surrounding the umbel in a kind of involucre. Radical leaves 2—3-ternate. Flowers white. April, May. Per. *Rue Anemone.*

4. RANUNCULUS.

Calyx 5-sepaled; petals 5, with a nectariferous pore at the base of each, inside; achenia numerous, crowded.

Said to be derived from *rana*, a frog, on account of the aquatic habits of

some of its species. A large and well known genus of perennial herbs, made the type of the Order. Cal. inf. of 5 ovate leaves. Pet. 5, roundish, shining. Nect. a pore sometimes covered by a scale. Fil. numerous, much shorter than pet. Ova. many, collected into a round head.

* Leaves simple, undivided.

1. R. Fla'mmula.

Leaves smooth, lanceolate, the lower ones petiolate; *peduncles* opposite the leaves; *stem* declining, rooting. An aquatic herb, growing in ditches, &c. Root fibrous. Stem 6—18 inches long, more or less decumbent, with alternate, nearly entire leaves thickened at the tip. Flowers lateral and terminal, solitary, of a golden yellow. It contains a very acrid juice. Jn.—Aug.
Small Spearwort.

2. R. reptans. *L.* Var. filiformis. *B.*

Very small, smooth; *stem* filiform, creeping, geniculate; *nodes* one-flowered; *leaves* linear-subulate, obtuse. A very slender species, 6—10 inches long, creeping on river banks, &c. with small, yellow flowers, fading to white, on axillary peduncles. Fruit very smooth. Jl. *Creeping Crowfoot.*
β. ovalis. B. Petals 5—8. Leaves oval and lanceolate.

3. R. cymbala'rius.

Very small, smooth; *stem* filiform, creeping, rooting at the joints; *leaves* reniform-ordate, crenate-dentate; *peduncles* solitary, mostly 2-flowered; *petals* spathulate; *fruit* oblong. In salt marshes, at Salina, &c. Flowers small, with bright yellow petals. June. *Sea Crowfoot.*

* * Leaves divided.

4. R. aborti'vus.

Radical leaves roundish, cordate at base, crenate, petiolate; *cauline leaves* ternate or pedate, angular, with linear segments. A very pretty species found in woods, remarkable for the dissimilarity of the root and stem leaves. Stem nearly a foot high, smooth as well as the leaves. The leaves which spring from the root are on long stalks, kidney-shaped or roundish-heart-shaped, regularly margined with crenate divisions. The lower stem leaves are pedate, with a pentangular outline; the upper, in 3-deep divisions, sessile. Flowers small, yellow. Fruit in globular heads. May. Jn. *Round-leaved Crowfoot.*

5. R. scelera'tus.

Smooth; *lower leaves* palmate; *upper* ones sessile, digitate; *fruit* oblong. Grows in wet places. The stem is much branched, a foot high, round, thick, hollow. Lower leaves more evidently stalked, larger and less deeply divided than the upper ones. Floral leaves (bracts) mostly simple, lanceolate and entire. Flowers numerous, small, yellow. Calyx deflexed. This is one of the most acrid of the tribe, and will raise blisters upon the skin. Jn. Jl.
Celery Crowfoot.

6. R. acris.

Leaves pubescent, in 3-divisions, incisely cut and toothed, the upper ones linear; *stem* erect, many-flowered; *calyx* spreading. This is the more common species, variously denominated butter-cups, yellow-weed, &c. It spreads rapidly in pastures and meadows, and often becomes an annoyance to farmers, since cattle will not eat it except when dry, and even then with little relish. Stem 2 feet high, hollow, branching. Upper leaves in 3 linear, entire segments.

Flowers large, of a brilliant yellow, and so numerous as often to clothe whole fields in their golden mantle. There is a cultivated variety, with double flowers. Jn.—Sept. *Butter-cups.*

7. R. BULBO'SUS.

Hairy; *stem* erect, bulbous at the base; *radical leaves* ternate; *leaflets* petiolate, incisely dentate, each about 3-cleft; *peduncles* furrowed; calyx reflexed. This is another acrid species, very common in pastures, mow-lands, &c. Root fleshy. Stem leafy, furrowed, 12—18 inches high, hollow, thickened at the base into a sort of bulb, and dividing above into upright peduncles, with golden-yellow flowers. It is well distinguished from R. acris by the lower ternate and hairy leaves, and the reflexed calyx leaves. Flowering all summer. *Bulbous Crowfoot.*

8. R. FASCICULA'RIS.

Leaves pubescent, ternate, the middle segment deeply 3-cleft; *calyx* spreading, villous, shorter than the petals; *stem* erect, branching. Grows on dry hills and in woods, flowering in April and May. Root a *fascicle* of fleshy fibres. Root leaves on long stalks, so divided as to appear nearly pinnate. Flowers large. Nectary a flat scale as broad as the transparent claw of the petal. Calyx spreading, yellow inside, hairy outside. *Early Crowfoot.*

9. R. PENNSYLVA'NICUS. *L.* R. Hispidus. *P.*

Stem hispid, erect, branching; *leaves* ternate; *leaflets* stalked, deeply 3-cleft, cut and toothed, hairy beneath; *calyx* reflexed, rather longer than the roundish petals. A very hairy plant, above a foot high, found in wet meadows. Leaflets strongly veined with spreading segments. Flowers numerous, bright yellow, terminal. Petals orbicular, hardly as long as the calyx. Jn.—Aug. *Bristly Crowfoot.*

10. R. RECURVA'TUS.

Stem erect; *leaves* 3-parted, incised at the apex and cuneiate at the base, hairy; *calyx* recurved; *petals* linear-lanceolate. Also a hairy species, a foot high, growing in woods. Stem very hairy, branched at top and leafy. Leaves somewhat 5-angled, in 3-broad-oval segments, the lateral ones 2-lobed. Flowers small, nearly white or yellowish. Achenia ovate, with minute, hooked beaks. May.—Jl. *Recurved Crowfoot.*

11. R. REPENS.

Leaves ternate; *leaflets* crenate, 3-lobed, cut-dentate; *main stems* creeping, flowering ones erect; *peduncles* furrowed; *calyx* spreading. In wet or shady places. Readily distinguished by its long, prostrate stems which are jointed, leafy and branching. The upright stems are short and ramose with bright yellow flowers of middle size. Petals often emarginate. The herb is dark green, rather rough and hairy. Flowers all summer. *Trailing Crowfoot.*

12. R. PU'RSHII. *Richardson.* R. Fluviatilis. *B.*

Floating; *leaves* cleft into numerous capillary segments with axillary leaflets; *peduncles* opposite to bracts; *petals* 5—8, of ovate, twice as long as the calyx; *nectary* concave. It grows in stagnant pools, where the stems float in the water, and are several feet in length. Leaves on short stalks, all submerged, with clasping membranaceous stipules. Peduncles emerging, forked, striate, bearing large, terminal, yellow flowers. Nectary nearly as long as the filaments. Calyx spreading, caducous, thick, hairy. May. Jn. *Floating Crowfoot.*

13. R. AQUA'TILIS. *L.* R. Fluviatilis. *W.*

Stems submerged, filiform; *leaves* all capillary-dichotomous. In ponds and sluggish streams, where the whole plant is submerged with the exception of the flowers. Stem long, slender, weak, round, smooth. Leaves alternate, divided in a dichotomous manner into innumerable, hair-like segments. Peduncles opposite the bracts. Flowers yellowish white. This species is hardly distinct from the preceding. Jl. Aug. *River Crowfoot.*

14. R. ASIA'TICUS.

Leaves ternate and biternate; *segments* toothed or cut, trifid; *stem* erect, simple or branched; *fruit* in a cylindrical spike. Native of Levant. This popular and splendid flowering species has been cultivated for centuries in the gardens of Europe, and has become frequent in those of this country. Under cultivation it sports into innumerable varieties, chiefly double, of every conceivable, variegated hue. More than 800 varieties have been named in European catalogues. Indeed the varieties raised from seeds may be said to be endless, since no two plants will flower alike, or like the original. Favorite sorts must be propagated by offsets, and will generally blossom the first year. It prefers a rich loamy soil, well manured with fine rotten compost. The roots are to be planted in Nov. Seeds sown in April. The plant grows 1—2 feet high, leafy, branches from the middle, bearing several flowers, which are not unfrequently 6 inches in diameter. May. Jn. *Garden Ranunculus.*

5. CLE'MATIS.

Calyx 4—8-sepaled; corolla 0: achenia with a long, plumose cauda.

Gr. κλημα, a tendril; the species are perennial, climbing herbs. Sep. 4, rarely 5, 6 or 8, colored, oblong, lax, pubescent. Fil. numerous, shorter than calyx. Ova. 4—20. Sty. longer than stam. Achen. tailed with the long, perm. style.

1. C. VIRGINIA'NA.

Climbing; *leaves* ternate; *leaflets* ovate, cordate, cut-dentate and lobed; *flowers* diœcious. A very common, hardy, climbing plant, found in shady thickets. Stem many feet in length, supporting itself on fences and bushes by means of its long, opposite petioles, which serve as tendrils, twining around twigs, &c. Flowers white, in large, axillary, dichotomous panicles. The seeds when ripe are furnished with long, plumose tails (caudæ,) appearing in large downy tufts. Aug. *Virgin's Bower.*

2. C. VIO'RNA.

Climbing; *leaves* compound and decompound; *leaflets* ovate-lanceolate, acute at each end, trifid and entire; *flowers* solitary, campanulate; *sepals* thick, leathery, acuminate. A twining vine a dozen feet in length, cylindric, striate. Leaves opposite, stalked, composed of 9 or 12 leaflets which are arranged in 3s. Flowers purple, axillary. Peduncles long, with a pair of simple leaves in the middle. Fruit with long, plumose tails. Jn. *Leather-flower.*

3. C. CRISPA.

Climbing; *leaves* pinnate and ternate; *leaflets* divaricate, ovate-lanceolate, acute, 3-lobed or entire; *flowers* solitary; *sepals* acuminate, revolute, with undulated margins. Stem twining, 6—8 feet long. Flower large, pale purple, bell-shaped, the sepals approximate in their lower part, and spreading or revo-

lute at the end. Flower-stalk axillary, shorter than the leaf. Fruit with a naked cauda. Jl. *Curl-flowered Clematis.*

4. C. FLA'MMULA.

Leaves pinnate, segments smooth, entire, round-oval, oblong or linear, acute From France. A fine climber for arbors, &c. very ornamental and sweet scented. Flowers white. Jl.—Oct. *Sweet Virgin's Bower*

5. C. FLO'RIDA.

Leaves ternate, decompound; *segments* ovate, acute, entire; *sepals* acuminate, naked. From Japan. Vine 12 feet long, with large, white and yellow flowers. Jn.—Sept. *Large-flowered Virgin's Bower.*

6. C. VITICE'LLA.

Leaves entire, ternate, decompound; lobes or segments entire; *sepals* obovate. From Spain. This, as well as the preceding species, is often double-flowered. Vine 20 feet long. Flowers purple.

7. C. VERTICILLA'RIS. *Dc.* Atragene Americana. *Sm.*

Leaves verticillate, in 4s, ternate; *leaflets* cordate, nearly entire; *peduncles* 1-flowered; *petals* acute. A beautiful climbing vine, in highland woods, at Windsor, Vt. Stem ascending trees 15 feet by means of its clasping leaf-stalks. At each node is a whorl of 4 ternate leaves and 2 large, purple, opposite flowers. May. Jn. *Whorl-leaved Virgin's Bower.*

All the species are ornamental and of easy culture. They require only a common soil, and are propagated by layers, cuttings, or from the seed.

6. ANEMO'NE.

Calyx 5—9-sepaled: corolla 0: achenia numerous.

Gr. ανεμος, wind; because most of the species grow in elevated, windy places. A rather large genus of perennial herbs. Sep. 5—15, regular, colored. Fil. numerous, much shorter than sep. Ova. sup., collected into a roundish, or oval head. Sty. numerous, short.

1. A. NEMORO'SA.

Leaves ternate; *leaflets* 5-parted, with incisely dentate, lanceolate and acute segments; *involucrum* similar (to the leaves.) petiolate; *stem* 1-flowered. A common and interesting little plant, found in old woods, hedges, and sometimes in open fields. Root creeping. Stem 6—10 inches high, erect. The involucre consists of 3 petiolate leaves placed in a whorl near the top of the stem. Leaflets or bracts cut-toothed and lobed, the lateral segments cleft, sometimes quite to the base, so as to render the leaf quinate. At the top of the stem is a single flower of 5 sepals, which are white, purplish outside. Apr. May. *Wood Anemone. Wind-flower.*

2. A. VIRGINIA'NA.

Leaves ternate, segments trifid, cut-toothed, acuminate; *fruit* in an oblong ovate head. A tall species of very different aspect from the Wood Anemone, found in dry woods, and in hilly pastures. Stem erect, 2—3 feet high, round, straight, hairy, branched into about 3 very long, sraight, erect parallel peduncles. Flowers solitary, yellowish green. Calyx silky outside. Fruit woolly. July. *Virginian Anemone.*

3. A. PENNSYLVA'NICA. *L.* A. aconitifolia. *Mx.*

Stem dichotomous; *radical* leaves palmate; *cauline leaves* sessile, clasping, 3-cleft, the lower ones ternate, with acute, lanceolate, incisely serrate lobes; *peduncles* solitary, 1-flowered; *fruit* in globose heads, subulate-beaked. Stem about 15 inches high, divided above the middle into 2 shortish branches with a flower-stalk between them, and a whorl (involucre) of 3 leaves at their base. Flowers large, white, appearing in June. *Pennsylvanian Anemone.*

4. A. CYLI'NDRICA. *Gray.*

"Silky pubescent; *leaves* ternately divided; lateral segments 2-parted, the intermediate one 3-cleft; *lobes* linear-lanceolate, with the apex incisely toothed; those of the involucre petioled; *peduncles* 2—6, rarely 1; *sepals* 5, obovate, obtuse; *carpels* woolly in a long cylindrical head." N. Y. Vt. Lebanon, N H. Plant 2 feet high, the diverging, subumbelled peduncles a third as long. Flowers pale yellow, large, solitary. Heads of carpels an inch in length. May. Jn.

5. A. MULTI'FIDA. *Dc.* A. Hudsoniana. *Rich.*

Hairy; *leaves* ternately divided; *segments* cuneiform, 3-cleft, gashed, the lobes linear acute, those of the involucre and involucels similar, on short petioles; *sepals* 5—8, oval-obtuse. About a foot high. Flowers white, yellow, red or purple. Sepals covered with a silky pubescence outside. In the valleys of the Hudson and Ct.

6. A. CORONA'RIA.

Leaves ternate, with multifid segments and linear, mucronate lobes; *sepals* 6, oval, close. From Levant. A hardy flowering plant, with large, single or double variegated flowers. May. *Poppy Anemone.*

8. A. HORTE'NSIS.

Leaves 3-parted, with crenate, cut-dentate lobes; *invol.* sessile, of oblong, entire or cut leaflets; *sepals* 10—12, oblong. From Italy. A fine garden species, with double and semidouble varieties of red, white and blue flowers. May. *Star Anemone.*

Anemonies prefer a fresh, loamy soil. The root is commonly planted in October, but if planted every month they flower every month.

7. HEPA'TICA.

Involucre of 3 bracts, entire, resembling a calyx: calyx of 6—9 petaloid leaves, disposed in 2 or 3 rows: achenia awnless.

Gr. ἡπατικος, of the liver; the three lobes of the leaf have been compared to the three lobes of the liver. Invol. of 3, ovate obtuse, hairy leaflets, situated on the scape a short distance below the colored calyx. A small genus of small perennial herbs.

H. TRI'LOBA. *Chaix.* Anemone Hepatica. *L.*

Leaves trilobate, the lobes entire; *scape* one-flowered, hairy. This little plant is one of the earliest harbingers of spring, often putting forth its neat and elegant flowers in the neighborhood of some lingering snow-bank. The root consists of numerous and strong fibres. Leaves all radical, on long, hairy petioles, smooth, evergreen, coriaceous, divided into 3-lobes which suggest all its names. Flowers on scapes 3 or 4 inches long, solitary, numerous, generally blue, but

frequently in varieties of white and flesh-color. They are also sometimes double. In respect to the form of the leaves there are two varieties :

α. *obtusa*, lobes obtuse, rounded;

β. *acuta*, lobes acute.

Grows in woods, the former variety prefering the south side of hills, the latter, the north. In the garden, it makes a fine border flower. April.

Liverwort. Early Anemone.

8. HYDRA'STIS.

Calyx 3-sepaled; corolla 0; berry composed of one-seeded acines.

Gr. ὕδωρ, water; in reference to the humid places in which it grows. Cal. of 3, ovate, regular, colored leaves, a little longer than the numerous fil. Sty. numerous.

H. CANADE'NSIS.

Stem with 2 alternate leaves above, which are petiolate, emarginate at base, palmate with 3—5 lobes; *peduncle* terminal, solitary, 1-flowered. The only species. In bog meadows. The root is of a deep yellow color internally. Stem 6—9 inches high, becoming purplish, hairy above. Flowers solitary, white, of short duration. Fruit resembling the raspberry, red and juicy. May. June. *Turmeric-root.*

9. CALTHA.

Sepals 5, orbicular; petals 0; capsules 5—10, one-celled, many-seeded.

Gr. καλαθος, a goblet; in allusion to the form of the yellow calyx which may be well compared to a golden cup. Sep. petaloid, inf. Nec. 0; Fil. many, shorter than sep. Ova. 5—10, obl. compr. erect. Styles 0.—Aquatic herbs.

C. PALU'STRIS.

Stem erect; *leaves* cordate, suborbicular, acute, crenate. A smooth, handsome, early flowering plant, native of wet meadows, which it adorns with a profusion of dark green leaves and bright yellow flowers. Root large, branching. Stem about a foot high, hollow, round, dichotomous. Lower leaves on long, semi-cylindric foot-stalks. Upper ones sessile, all of a deep, shining green, veiny and smooth. Flowers of a golden yellow in all their parts, on simple, axillary stalks. The outer row of filaments twice as long as the inner, club-shaped. The young leaves are in great request in spring for *greens*. A variety, with double flowers is cultivated in gardens. May. Per.

Cowslips. Marsh Marygold.

10. DELPHI'NIUM.

Calyx of 5 sepals, colored, the upper one spurred; corolla 4-petaled, very irregular, terminating behind in a tubular, nectariferous spur, enclosed in the spur of the calyx; styles 1 or 3; follicles 1 or 3.

Gr. δελφιν, a dolphin, on account of the fancied resemblance of the flower to that animal. The species are showy, annual or perennial herbs, with much-

divided leaves and irregular blue, purple or red (never yellow) flowers. Only two or three are natives of this country.

1. D. EXALTA'TUM.

Petioles not dilated at base; *leaves* flat, 3-cleft below the middle; *segments* cuneiform, 3-cleft at the end, acuminate, the lateral ones often 2-lobed; *racemes* straight; *spur* longer than the calyx. Native of the Middle States, rarely of the Northern. Stem 3 or 4 feet high, straight and erect. Flowers of a brilliant purplish blue. It is deservedly esteemed in the flower garden, and of the easiest culture. Jl. Aug. Per. *American Larkspur.*

2. D. CONSO'LIDUM.

Stem suberect, smooth, with spreading branches; *flowers* few, loosely racemed: *peduncles* longer than bracts; *fruit* smooth. From Europe. This is the common Larkspur of the gardens. A showy, branching annual of the easiest culture, with varieties of double and semidouble, blue, pink, purple and white flowers. Jn. Jl. *Branching Larkspur.*

3. D. GRANDIFLO'RUM.

Leaves palmate, many parted; *lobes* linear, distant: *pedicels* longer than bract; *petioles* shorter than calyx. A superb, perennial species from Siberia. Flowers in spikes of brilliant dark blue with a tinge of purple, double or single. Its culture requires but little care. Jn. Jl. *Great-flowered Larkspur.*

D. Ajacis, the Rocket Larkspur, also common in gardens, is probably only a variety of *D. consolidum.*

11. COPTIS.

Calyx 5 or 6 sepaled, deciduous; corolla 5 or 6, small cucullate; follicles 5—8, stipulate, diverging, rostrate, 5—6-seeded.

Gr. κοπτω, to cut; in allusion to the numerous divisions of the leaves. Small perennial herbs. Sep. obl. concave. Pet. obconic, hollow, yellow at the end. Stam. many, white. Low, perennial herbs.

C. TRIFO'LIA.

Leaves ternate; *scape* 1-flowered. A small stemless plant, well known by its long, thread-like roots of golden yellow color. Grows in woods and groves. Leaves radical or nearly so, on long stalks, of 3, sessile leaflets. These are obovate and roundish, crenate and lobed, smooth. Scape 3 inches high, slender, bearing a single, white, starlike flower. The 5 or 6 yellow petals are barely distinguished among the white stamens by their color. The root is tonic, bitter, and used in medicine. May. *Goldthread.*

12. TRO'LLIUS.

Calyx of 5—10—15 sepals, deciduous; corolla of 5—20 small, linear petals, tubular at base; follicles many, subcylindric, many-seeded.

Germanic *trol* or *trolen*, signifying something round; in allusion to the form of the flowers. Sep. roundish-ovate, concave. Fil. numerous, linear, much shorter than cal. Ova. sup. many. Sty. shorter than stam.

1. T. AMERICA'NUS. *Mu.* T. laxus. *P.*

Sepals 5, oblong, spreading; *petals* shorter than the stamens. A plant with the general habit of a Ranunculus. In swamps. About a foot high. Leaves palmate, deeply cleft in 5 segments which are lobed and cut-dentate. Sepals yellow, resembling petals, 3-4 inch in length. Petals very small, orange-colored. Capsules about 10, crowned with the pusistent styles. This is the only American species, and is happily named by Dr. Muhlenburgh in reference to the two others which follow. June. Per. *American Globe Flower.*

2. T. EUROPÆ'US.

Sepals closely converging; *petals* equal to the stamens. Native of Europe. Stem 2 or 3 feet high, erect, branching, leafy. Leaves deeply divided into many wedge-shaped, acute, cut and toothed lobes. Flowers solitary, at the naked summits of the branches, erect, globular, about an inch wide, of a fine yellow. A very ornamental flower, of easy culture from seeds or roots. May. June. *European Globe Flower.*

T. ASIA'TICUS.

Sepals spreading; *petals* longer than the stamens. Native of Asia. About 2 feet high. An ornamental flower, like the preceding, of easy culture. Flowers more open, and of a fine orange color. *Asiatic Globe Flower.*

13. AQUILE'GIA.

Calyx 5-sepaled, colored, caducous; petals 5, each terminating behind in a spurred nectary; styles 5; follicles 5; many-seeded.

Lat. *aquila*, the eagle; the inverted spurs of the petals have been likened to the talons of a bird of prey. Cal. inf. of 5, equal, ovate, spreading leaves, resembling petals. Cor. of 5 equal petals, alternating with the sepals, each tubular, dilated at the mouth, the outer margin erect, the inner attached to the torus, extended behind into a long, spurred nectary. Fil. 30—40, the inner ones longer and barren. Ova. 5, oblong, tapering into the style.

1. A. CANADE'NSIS.

Spurs straight; *styles* and *stamens* exserted; *calyx* rather acute, longer than the corolla; *divisions* of the leaves 3-parted, rather obtuse, cut-dentate. This beautiful plant grows wild in most of the States, in dry soils, generally on the sunny side of rocks. It is cultivated with the greatest ease, and is much more delicate in foliage and in the hues of its flowers, than the common blue Columbine. Stem branching, a foot high, with ternate, lobed leaves. Flowers terminal, scarlet without and yellow within, pendulous, much embellished by the numerous, descending, yellow stamens and styles. Fruit erect. May. Per. *Wild Columbine.*

2. A. VULGA'RIS.

Spurs incurved; *stems* leafy, many-flowered; *leaves* nearly smooth, *styles* not longer than the stamens. A hardy perennial, from Europe, well known in gardens. Stems 1—2 feet high, with a profusion of handsome, smooth foliage, and large blue flowers. In cultivation, the flowers become double by the multiplication of the hollow, spurred petals. They also vary in color through all the shades between blue and white. Jn. Per. *Common Columbine.*

14. ACONI'TUM.

Calyx of 5 sepals, colored, the upper one vaulted; corolla of 5 petals, the upper 3 minute, the lower 2 on long claws,

concealed beneath the upper sepal, recurved and nectariferous at the summit. Style 3—5; follicles 3—5.

Gr. ακονιτος, without dust; because the plants grow on dry rocks. Rank, herbaceous perennials, upright, from 2 to 6 feet high, with many palmate or digitate, dark-green lvs. with terminal spikes of large blue and yellow flowers.

1. A. UNCINA'TUM.

Stem flexuose; *leaves* palmate, 3—5-parted, with rhomboidal-lanceolate, cut-dentate divisions; *upper lip* of the calyx lengthened, convex, beaked. A cultivated, poisonous plant, which is said to be found wild in some parts of N. Y. Two feet high. Flowers blue. Jl. Aug. *American Wolf's-bane.*

2. A. NAPE'LLUS.

Upper sepal arched at the back; *lateral* ones hairy on the inside; avaries 3, smooth; *leaves* deeply 5-cleft, cut, with linear segments, furrowed above. The common Monk's-hood is found wild in Virginia, and although a noxious poison, is cultivated among flowers. It is a tall, rank plant, making quite a consequential appearance. Stem about 4 feet high, with a long spike of flowers at its termination. Flowers dark blue, surmounted by the vaulted upper petal as if hooded in a monk's cowl. There are varieties with flowers white, rose-colored, &c. Aug. *Monk's-hood.*

15. ADO'NIS.

Calyx of 5 appressed sepals; petals 5—15, with naked claws; achenia in a spike, ovate and pointed, with the hardened, persistent style.

The plant which is feigned to have sprung from the blood of Adonis, when wounded by the bear.

1. A. AUTUMNA'LIS.

Flowers 5—8 petaled; *fruit* subcylindric; *petals* erose or emarginate. A hardy annual, from England, naturalized in N. Y. It is a desirable flower for the garden. The seeds should be sown in Autumn, in a light soil. Flowers crimson. *Pheasant's-eye.*

2. A. VERNA'LIS.

Lower leaves abortive; upper ones sessile; fruit velvety; petals 10—12, oblong, subdentate. An ornamental perennial, from Europe, a foot high, white, yellow flowers. *Perennial Adonis.*

16. PÆO'NIA.

Calyx of 5 sepals; corolla of 5 petals; style 0; stig. 2 or 3; follicles many-seeded.

The physician *Pæon*, according to mythology, first used this plant in medicine, and cured Pluto with it. The petals are excessively multiplied by cultivation. The species are magnificent flowering plants.

P. OFFICINA'LIS.

Fruit downy, nearly straight; *segments* of leaves unequally cut; lobes ovate lanceolate. The splendid Pæony has long been cultivated in every part of

Europe and in this country. This species is said to be native of Switzerland. It is a hardy perennial, requiring very little pains for its cultivation. Among its varieties the *double red* is the most common. The *white* is truly beautiful. The *flesh-colored* and *pink-colored* are also favorites. Flowers in May and June. *Common Pæony.*

16. NIGE'LLA.

Calyx of 5 sepals, colored; corolla of 5, 3-cleft petals; styles 5; capsules 5, follicular, convex.

Lat. *niger*, black; the color of the seeds which are used in cookery.

1. N. DAMASCE'NA.

Anthers obtuse; *capsules* 5, smooth, 2-celled, united as far as the end into an ovate, globose one; *flowers* in a leafy involucre. Native of S. Europe. A hardy annual of the gardens, to which has been applied the gentle names of 'ragged lady,' 'devil in a bush,' &c. Leaves twice and thrice pinnatifid, as finely cut as those of the Fennel. Flowers terminal, solitary, encompassed and over-topped by a circle of leaves divided like the rest. They are often double, of a white or pale blue color. June—Sept. *Fennel Flower.*

2. N. SATI'VA.

Anthers obtuse; *capsules* muricate; *stem* erect, hairy; *flowers* naked, pale blue. From Egypt. Rather smaller than the last. June—Sept. Ann. *Nutmeg Flower.*

ORDER II. MAGNOLIACEÆ. *The Magnolia Tribe.*

Cal.—Sepals 3—6, deciduous, colored like the petals.
Cor.—Petals 6—12, hypogynous, in several rows, imbricate, in æstivation.
Sta.—Indefinite, hypogynous, distinct, with short filaments and adnate anthers.
Ova.—Several, in many rows upon an elongated torus.
Fr.—Follicular, or baccate, 1—2-seeded.
Sds.—Attached to the inner suture of the carpels from which [in Magnolia] they are suspended by a long, delicate funiculus.

An order containing but few genera, including, however, some of the most splendid and majestic forest trees. The Southern States seem to be the region of most of them. China, Japan and the Indies contain a few.

Properties. The bark of the species mentioned below contains an intensely bitter principle, which is tonic and stimulating, and the corollas are aromatic beyond almost all other flowers.

Genera.

Carpels dehiscent by the dorsal suture, seeds pendulous,	*Magnolia*,	1
Carpels indehiscent, seeds enclosed, not pendulous,	*Liriodendron*,	2

1. MAGNO'LIA.

Sepals 3—5; petals 6—12, caducous; carpels 2-valved, 1—2-seeded, imbricated into a cone; seeds baccate, subcordate and suspended.

Named in honor of Pierre Magnol, physician and botanist of Montpelier, France, author of 'Botanicum Montpeliense.' 1676. A superb genus, consisting mostly of large trees, with luxuriant foliage, and large, fragrant flowers.

1. M. CLAU'CA.

Leaves oval, glaucous beneath; *petals* obovate, tapering to the base. This species is native in N. Eng. particularly at Gloucester, Ms. and in the Middle

States. The tree is about 25 feet in hight, remarkable only for the beauty of its foliage and flowers. The leaves are smooth and entire, of a regularly elliptical form, remarkably pale beneath. Flowers terminal, white, solitary, of 3 sepals and several concave petals, appearing in July. *White Bay.*

2. M. GRANDIFLO'RA.

This is the noblest species. Although inferior in size to the Tulip-tree, yet no tree of the American forests can compare with the stateliness of its form or the magnificence of its foliage and flowers Its ordinary stature is about 60, rarely 75 or 80 feet, with a diameter of 1—3 feet. The trunk is nearly straight, covered with a greyish bark, bearing a pyramidal summit. Foliage exceedingly rich and shining. Flowers white and fragrant, nearly a foot broad, and often very numerous, presenting the most brilliant display of vegetable luxuriance that can be imagined. It is common in the Southern States, but not found farther north than Pennsylvania. *Big-Laurel. Magnolia.*

3. M. ACUMINA'TA.

Leaves oval, acuminate, pubescent beneath; *petals* obovate, obtusish. Grows near the falls of Niagara, but is more abundant in the S. States. It is a noble forest tree, equal in size to the preceding. Trunk perfectly straight, bearing an ample and regular summit. Leaves very acuminate. Flowers 5—6 inches in diameter, bluish, sometimes yellowish white, numerous and finely contrasted with the rich dark foliage. Cones of fruit about 3 inches long, cylindric, bearing some resemblance to a small cucumber. May. *Cucumber Tree.*

2. LIRIODE'NDRON.

Calyx 3-leaved; petals 6; seeds ending in a scale; carpels imbricated in a cone.

Gr. λειριον, a lily, δενδρον, a tree. The flowers, which may be likened to lilies or tulips, grow upon one of the loftiest trees of the forest.

1. L. TULIPI'FERA.

Leaves truncate at the end, with 2 lateral lobes. The Tulip tree, both in respect to its size and beauty, is one of the most remarkable in the American forests. It is found in the southern part of Ms. thence in the Atlantic States to Carolina, but is especially abundant in the Western States. It is ordinarily about 80 feet high, with a diameter of 2 or 3 feet; but along the Ohio and Mississippi rivers trees of this kind have been not unfrequently found much exceeding 100 feet in hight, with a diameter of 4—6 feet, inferior in dimensions only to the Pine. The trunk is perfectly straight and cylindric, and the branches disposed with much regularity. In June and July it puts forth numerous large and brilliant flowers, variegated with different colors, among which yellow predominates. They are solitary, terminal, fragrant. The foliage is very luxuriant, dark green, smooth, on long petioles. The wood is considered valuable for various kinds of lumber. *Tulip Tree.*

ORDER V. MENISPERMACEÆ. *The Moon-seed Tribe.*

Fls.—Diœcious.
Cal.—Sepals 3—8, in a double series, 2—4 in each, imbricated in æstivation, hypog., decid.
Sta.—Distinct or monadelphous, equal in number to the petals and opposite to them, or 3 [or 4 times as many.
Anth.—Innate and consisting of 4 globose lobes.
Ova.—Usually solitary, sometimes 2—4.—*Fruit*; a drupe, globose-reniform.

This order is neither large nor important. Most of the genera which compose it are natives of Tropical Asia and America. They are mostly twining shrubs or herbs. The only Northern genus is Menispermum.

Properties. A few plants of this order contain a bitter principle in their roots. A foreign species of Menispermum yields the *Columbo* of the shops, which is a valuable tonic; and another genus, Anamirta coculus of India, furnishes the *Indian cockle*, so intoxicating to fishes.

MENISPE'RMUM.

Flowers diœcious; sepals 4—8, in a double row; petal 4—7, minute, retuse. *Sterile Fl.* Stamens 12—20. *Fertile Fl.* Ovaries and styles 2—4; drupes 1-seeded, seed lunate and compressed.

Gr. μηνη, the moon, σπερμα, seed; on account of the crescent form of the fruit.

M. CANADE'NSE.

Stem climbing; *leaves* cordate, roundish, angular, peltate, the petiole inserted near the base: *racemes* compound; *petals* 8. In woods and hedges. Stem 8 or 10 feet long, with alternate leaves about 5-angled, and on long stalks. Flowers in axillary clusters, small yellow. The root is perennial, and is used in medicine as a tonic. July. β, *lobatum* has leaves lobed. *Moon-seed.*

ORDER VI. BERBERIDACEÆ. *The Berberry Tribe.*

Cal.—Sepals 3—4—6, imbricate in two rows, often reinforced by petaloid scales.
Cor.—Hypogynous: petals 1 to 3 times as many as the sepals, and opposite to them.
Sta.—As many, or twice as many as the petals, and opposite to them.
Anth.—Generally opening by recurved valves, extrorse.
Ova.—One-celled, solitary, simple. *Style* often lateral. *Stig.* often lateral or peltate.
Fr.—Berried or capsular.
Sds.—One or few, attached to the bottom of cell, or many, attached to lateral placentæ.

A small order inhabiting the Temperate Zones. Some genera, as the Podophyllum and Jeffersonia, possess cathartic properties. Others, as the Berberis, contain in their fruits malic and oxalic acid. In habit they are generally herbaceous, only a few attaining to the structure of shrubs.

Conspectus of the Genera.

Herbs, perennial;	Petals 8, flower on a scape,	*Jeffersonia.*	3
	Leaves not peltate; Petals 6, with a scale at base,	*Leontice.*	4
	Leaves peltate; stamens numerous, ...	*Podophyllum.*	2
Shrubs, with yellow flowers and irritable filaments,	. . . . .	*Berberis.*	1

1. BE'RBERIS.

Calyx 6-sepaled, inferior; corolla 6-petaled; two glands at the base of each petal; style 0; berry 1-celled.

Name derived from the Arabic. Sep. 6, obovate, spreading, colored, the 3 outer smaller. Pet. 6, roundish. Fil. flattened. Anth. 2 separate lobes on the opposite edges of the connectile. Ber. oblong, pulpy, 1-celled. Seeds 2, 3. Fine hardy shrubs.

B. VULGA'RIS.

Racemes pendulous, spines 3-forked; serratures of the leaves terminated by soft bristles. A well known bushy and ornamental shrub, loving hard gravelly soils. Grows 3—5 feet high. Leaves obovate, serrate, well distinguished by their bristly serratures. Flowers yellow, in hanging clusters. The stamens

on being touched exhibit a remarkable degree of irritability by springing violently against the stigma. Berries oblong, scarlet, very acid, and when boiled with sugar form an agreeable jelly. The bark of the root dyes yellow. Jn.
Berberry Bush.

2. PODOPHY'LLUM.

Calyx of 3 sepals, caducous; corolla 6—9-petalled; stamens numerous, with linear anthers; berry 1-celled, crowned with the single stigma.

Gr. πους, ποδος, a foot and φυλλον, a leaf; in allusion to the long, firm petioles. Cal. of 3, oval, obtuse, concave leaves, falling when the flower expands. Pet. obov. concave, smooth, longer than stam. Anth. as long again as fil. Fr. large, ovate. Low neat herbs.

P. PELTA'TUM.

Leaves peltate, lobed; *flowers* 1. Grows in woods and cultivated grounds, especially common in Western N. Y. It is among our more curious and interesting plants. Grows about a foot high. Stem round, sheathed at base, erect, dividing into 2, round leaf-stalks, between which grows the flower. The leaves are large, smooth, deeply divided into 5—7 lobes, which are each 2-parted and dentate at the end. They are often peltate, but generally separate at base quite to the petiole. The flower is stalked, drooping, white with a 3-leaved, caducous calyx, and a corolla of about 6 petals, often more, curiously reticulated with veins. Fruit about the size of a plum, ovate, yellowish, acid, eatable, ripening early. The root is cathartic. May. Per. *May apple. Wild Mandrake.*

3. JEFFERSO'NIA.

Calyx of 4 sepals, colored, deciduous; corolla of 8 petals, incurved, spreading; stamens 8, surrounding the ovary; capsules obovate, stipitate, opening by a circumscissile dehiscence.

Named after President Jefferson, who was distinguished as a patron of science. Small plants, remarkable chiefly for the curious structure of the capsule, which opens like a snuff-box.

J. DIPHY'LLA.

Acaulescent; *peduncles* naked, 1-flowered; *leaves* in pairs. A singular little plant, half a foot high, growing in calcarious soils, N. Y. and Ohio. Petioles all radical, each bearing at the top a pair of binate leaves, which are placed base to base, and broader than long, ending in an obtuse point. Bracts lanceolate, entire, at the bases of the petioles. Scape as long as the petioles, 1-flowered. Flowers large, regular, white, starlike. The capsule opens only half round, and has, therefore, a persistent lid. This plant has, in Ohio, the reputation of a stimulant and antispasmodic, and is there significantly termed
Rheumatism Root.

4. LEO'NTICE.

Calyx 6-sepaled, inferior; corolla 6-petaled; cells of the anther opening at the edge; capsule berry-like, 1-celled.

Gr. λεων, a lion; the leaf is likened to a lion's foot-track. Nectaries 6, attached to the claws of the petals. Seed naked and stiped after having burst its caducous pericarp.

L. THALICTROI'DES. *L.* Canlophyllum thalictroides. *Mx.*

Smooth; *leaves* biternate and triternate; *leaflets* oval, the lower ones petioled and lobed; the terminal one 3-lobed. A handsome herbaceous plant, common in woods. Stem one or two feet high, dividing at the top into two branches, one of which is a thrice compounded leaf-stalk; the other bears a twice compounded leaf and a small racemose panicle of flowers. Leaves dark green, resembling those of the Thalictrum, and still more those of the Columbine (Aquilegia.) May. Per. *Poppoose Root.*

ORDER VII. CABOMBACEÆ. *The Water-Target Tribe.*

Cal.—Sepals 3—4, colored inside.
Cor.—Petals 3—4, alternate with the sepals.
Sta.—Hypogynous, either 6 or more than 17; *anth.* innate.
Ova.—2 or more; *stig.* simple.
Fr.—Indehiscent, tipped by the hardened style.
Sds.—Globular, pendulous.

A small order of aquatic plants, with centrally peltate, floating leaves, and yellow or purple flowers, which are axillary and solitary. The two genera which alone compose this order are both American, and are found from Cayenne, S. A. to N. Jersey. The Brasenia of Torrey and Gray's Flora, [Hydropeltis of Michaux] is found still farther north.

BRASE'NIA.

Sepals 3—4, colored within, persistent. Petals 3—4; stamens 18—36; ovaries 6—18; carpels oblong, ovate, 2, or by abortion, 1-seeded.

Eng. *brasset* signifies a helmet or target. Curious water-plants, with a leaf like a shield. The stem, peduncles, and lower surface of the leaves, covered with a gelatinous and viscid transparent substance.

B. PELTA'TA. *P.* Hydropeltis purpurea. *Mx.*

Leaves peltate, oval, entire; *peduncles* solitary, 1-flowered. An aquatic plant of curious structure. It inhabits muddy shores and pools usually in company with the water lily (Nymphæa.) The leaves are elliptical, on long flexible petioles, floating on the surface of the water, smooth and shining above, purplish beneath. It is very exactly peltate, the stalk being inserted in the centre. The whole plant except the upper surface of the leaves is covered with a slimy mucilage. Flowers purple, on long, slender stalks. July. Per. *Water Target.*

ORDER IX. NELUMBIACEÆ. *The Nelumbo Tribe.*

Cal.—Sepals 4—5.
Cor.—Petals numerous, in many rows, arising from without the disk.
Sta.—Numerous, in several rows; *fil.* petaloid; *anth.* adnate, introrse.
Ova.—Numerous, separate, with a simple style and stigma, half enclosed in hollows of the [elevated, fleshy and excessively enlarged torus.
Fr.—A nut, generally one-seeded.
Sds.—Destitute of albumen, and with a highly developed embryo.

This order comprizes but the single genus, Nelumbium, one of the species inhabiting the still waters of tropical regions, and the other, of the United States. The nuts are eatable, and indeed all other parts of the plant.

NELU'MBIUM.

The characters of the genus the same as those of the order.

Called in Ceylon, *Nelumbo.*

N. LU'TEUM. *W.* Cyamus Nelumbo. *L.*

Leaves peltate, orbicular, entire. A magnificent flowering plant, peculiar to the muddy lakes and stagnant waters of the South and West, but is occasionally met with in Ct. and N. Y. The rhizoma creeps in the mud at the bottom, in depths of water from 2 or 3 to 10 feet. From this arise the simple scapes and petioles, to the surface. Leaves very large, smooth and verdant, roundish, the petiole inserted one side of the centre. They sometimes cover the entire surface in large patches. The flowers bear a general resemblance to the pond lily, but are several times larger, and want its fragrance. The petals are broad and concave, of a brilliant white, becoming yellow towards the centre. The nuts imbedded in the torus are about the size of acorns, and are roasted and eaten as nuts by the Indians, or dried and pulverized into a bread meal.
Water Chinquapin.

ORDER X. NYMPHÆACEÆ. *The Water Lily Tribe.*

Cal.— } Sepals and petals numerous, imbricated, gradually passing into each other. *Sep.*
Cor.— } persistent. *Pet.* inserted upon the disk which surrounds the pistil.
Sta.—Numerous, in several rows upon the disk. *Fil.* petaloid. *Anth.* adnate, introrse.
Ova.—Many-celled, many-seeded, surrounded by a fleshy disk.
Sds.—Attached to the spongy placentæ, and enveloped by a gelatinous aril.

A small order of aquatic plants, inhabiting the northern hemisphere. The general aspect of these plants is that of an endogen, but they have two foliaceous cotyledons.—The stems of the Nymphæaceæ contain a powerful astringent principle, which is removed by repeated washing in water, after which they are tasteless, and may be used for food.

Two of the genera are found in the Northern States; *Nymphæa*, which has flowers of a white or rose color, and *Nuphar*, with yellow flowers.

1. NYMPHÆ'A.

Calyx of 4 or 5 sepals; corolla of numerous petals inserted on the disk; stamens gradually transformed into petals; stig. surrounded with rays; pericarp many-celled, many-seeded.

The Greek *Nymph* or *Naiad* of the waters. Beautiful aquatic plants.

N. ODORA'TA.

Leaves orbicular, cordate, entire, the *lobes* acuminate and veins prominent beneath; *calyx* equaling the petals, 4-leaved. The White Water Lily is truly one of the most lovely of flowers, possessing beauty, delicacy and fragrance in the highest degree. It grows only in ponds and quiet streams, where the water is of sufficient depth to protect the plant from the frosts of winter. The rhizoma is several inches in diameter, extending in its muddy bed beneath the water, to a great length, and sending up leaves and flowers to the surface. The leaves are nearly round, entire, of a fine glossy green, cleft at the base to the petiole, and floating on the surface of the water. The flowers consist of four sepals, white within, numerous, lance-shaped petals of the most delicate whiteness, often tinged externally with red, and a great number of yellow stamens beautifully curved. The filaments are gradually dilated from the inner to the outer series, so as to pass insensibly into petals. Flowers in July, sometimes in such profusion as to mantle the surface of the water, and perfume the air with exquisite fragrance. Per. *White Water Lily.*

2. NUPHAR.

Calyx 5—6 sepaled; corolla of numerous minute petals, inserted with the truncated stamens on the torus; stigma

discoid, with prominent rays; pericarp many-celled, many-seeded.

From the Arabic name which is *naufar*. Sep. oblong, concave, colored, much larger than the pet. which are furrowed at the back. Fil. numerous, linear. Anth. linear, 2-celled. Stig. circular, convex, with many radiating clefts.

1. N. ADVE'NA. *Ait.* Nymphæa advena. *Mx.*

Calyx 6-leaved; *petals* numerous; margin of the *stigma* crenate; *lobes* of the leaves divaricate. Very common in ditches, sluggish streams and muddy lakes, often covering the entire surface with its leaves. A well-looking and very curious plant, but from its filthy habits it has been called, with some justice, the *frog lily*. The stem (rhizoma) is large, creeping extensively. Leaves large, dark green, shining above, and, when floating, pale and slimy beneath. Petioles half-round. Flowers rather large and globular in form, erect on a thick, rigid stalk. Its most conspicuous part is the calyx, of which the 3 outer sepals are yellow inside, and the 3 inner entirely yellow, as well as the petals and stamens. June, July. Per. *Yellow Pond Lily.*

2. N. KALMIA'NA. *Ait.* Nymphæa Kalmiana. *Mx.*

Leaves cordate; *lobes* approximate; *calyx* 5-leaved; *stigmas* gashed, 8—12 rayed. A smaller species with small yellow flowers, growing in similar situations with the last. The leaf is smaller, with a roundish petiole. July. Per. *Kalm's Pond Lily.*

ORDER XI. SARRACENIACEÆ.

Cal.—Sepals 5, persistent, with a 3-leaved involucel at base. Æstivation imbricate.
Cor.—Petals 5, unguiculate, hypogynous, concave.
Sta.—Numerous, hypogynous. *Anth.* oblong, adnate, introrse.
Ova.—5-celled, placenæ central. *Sty.* single. *Stig.* dilated, peltate, 5-angled.
Fr.—Capsular, 5-celled, 5-valved, crowned with the broad, persistant stigma.
Sds.—Numerous, minute.

An order consisting of two genera, one inhabiting the bogs of N. America, the other in Guiana. In habit they are herbaceous, with fibrous roots and radical leaves, having hollow, urn-shaped petioles [ascidia, 214] with an articulated lamina.

SARRACE'NIA.

Calyx of 5 sepals, with 3 small bracts at base; petals 5, deciduous; stigma very large, peltate, persistent, covering the ovary and stamens; capsule 5-celled, 5-valved, many-seeded.

Named for Dr. Sarrazen of Quebec, who first sent this genus to Tourefort from Canada. The genus embraces six species, of which one only is native of the N. States.

S. PURPU'REA.

Leaves radical, decumbent, inflated, contracted at the mouth, winged on the inside, much shorter than the scape, with the broad, cordate, erect lamina articulated to the mouth. The Sarracenia, or Pitcher plant, as it is sometimes called, is certainly one of the most curious of all plants. It grows in wet meadows and on muddy shores, often in great abundance, where it is conspicuous for its tall, nodding, dark purple flowers. The leaves are large, composed of a hollow, pitcher-form petiole, swelling in the middle, with a winged, wavy

appendage extending lengthwise inside, and the cordate lamina as above, with inversed hairs at the mouth. Their capacity, when of ordinary size, is about a wine-glass, and they are generally full of water. The scape is a foot or more high, round, smooth, supporting a large, nodding flower, which is almost as curious in structure as the leaves. June. Per. *Side-saddle Flower.*

ORDER XII. PAPAVERACEÆ. *The Poppy Tribe.*

Cal.—Sepals 2, rarely 3, deciduous, imbricated in æstivation.
Cor.—Petals 4, rarely 5 or 6, hypogynous.
Sta.—Often numerous, but some multiple of 4, rarely polyadelphous. *Anth.* innate.
Ova.—Solitary, style short or 0. *Stig.* 2, or if more, stellate upon the flat apex of ovary.
Fr.—Either pod-shaped, with 2 parietal placentæ, or capsular with several.
Sds.—Very numerous, minute.

More than two-thirds of the genera of this order, which is small, are native of Europe. In habit, they are herbaceous or shrubby, and have a milky or turbid juice. Flowers mostly showy, but never of a blue color. Almost all the genera contain active, narcotic properties, principally resident in the turbid juices. The seeds are commonly rich in fixed oil. The order contains many highly ornamental, cultivated plants.

Conspectus of the Genera.

Juice	Leaves unarmed, entirely green, cauline,	*Chelidonium.*	2
	yellow; Leaves armed with prickly teeth, blotched with white,	*Argemone,*	3
	orange-red; leaves radical, reniform; capsule terete,	*Sanguinaria.*	1
	white; leaves unarmed, cauline, capsule globose,	*Papaver.*	4
	colorless; leaves multifid with linear segments; capsule terete,	*Chryseis.*	5

1. SANGUINA'RIA.

Calyx 2-sepaled, caducous; corolla 8-petaled; stamens numerous; stigma 1, 2-lobed, sessile; capsule pod-like, 1-celled, 2-valved, many-seeded.

Lat. *sanguis*, blood; all parts of the plant when wounded discharge a blood-colored fluid. Sep. concave, falling as soon as the corolla expands. Petals generally 8, in two series, the 4 outer ones longer, giving the flower a quadrangular outline. Anth. obl. yellow. Sty. 0. Pod obl. ovate, acute at each end.

S. CANADE'NSIS.

Leaves solitary, radical, reniform; *scape* naked, 1-flowered, sheathed at base; *petals* spreading, regular. The only species. An interesting flower of fertile woods, groves, &c. appearing in early Spring. Rhizoma fleshy, tuberous, and when broken or bruised, as well as every other part of the plant, exudes a blood-colored fluid. From each bud of the root-stock there springs a single, large, glaucous leaf, and a scape about 6 inches high, with a single flower. The whole plant is smooth. The leaf is kidney shaped, with roundish lobes separated by roundish sinuses. The flower is white, square and on a round scape. It is scentless and of very short duration. The juice is emetic and purgative. April. Per. *Blood Root.*

2. CHELIDO'NIUM.

Calyx 2-sepaled, corolla 4-petaled; stamens numerous; stig. 1, small, sessile, bifid; capsule silique-form, linear, 2-valved, 1-celled; seeds crested.

Gr. χελιδων, the swallow; because it was thought to flower with the arrival of that bird, and to perish with its departure. Sep. roundish. Pet. roundish,

flat, narrowed at base. Fil. about 30, shorter than cor. Ova. long as stam. Style 0.

C. MAJUS.

Leaves pinnate, lobed, the *segments* rounded; *flowers* in umbels. A plant found under fences, by road sides, &c. yielding a yellow juice. Stem 1—2 feet high with pinnate, glaucous, smooth, spreading leaves. Flowers yellow, in thin, axillary, stalked umbels. Petals elliptical, entire, and like every other part of the plant very fugacious. The juice is used to cure itch, and to destroy warts. May—Oct. Per. *Celandine.*

3. ARGEMO'NE.

Calyx 3-sepaled, caducous; petals 6; stamens numerous; capsules obovate, half-valved.

From *argema*, a former name for the cataract of the eye, which was thought to be cured by this plant. A small genus of annuals. Sep. roundish, concave, pointed. Pet. roundish, larger than cal. Fil. as short as the cal. Stig. sessile, capitate, 4—7-lobed. Caps. opening at tip by valves.

A. MEXICA'NA.

Leaves pinnatifid, gashed, spiny; *flowers* axillary; *capsules* 6-valved. A weedy plant in cultivated fields, &c. about 2 feet high, with prickly stems and leaves. It abounds in a milky juice which changes in the air to a fine, bright, gamboge yellow, and is said to be an active medicine, used for cutaneous eruptions, jaundice, sore eyes, fluxes, &c. Flowers yellow. Jl. *Horn Poppy.*

4. PAPA'VER.

Calyx 2-sepaled, caducous; corolla 4-petaled; stamens numerous; capsule 1-celled, opening by pores under the broad, persistent stigma.

Celtic, *papa*, pap, that is, a soft food given to children, in which the seeds of the poppy were boiled to induce sleep. The species are all exotics.

1. P. SOMNI'FERUM.

Calyx and capsules smooth, *leaves* clasping, gashed, glaucous. This and other species of the Poppy is of a fine appearance, with large brilliant flowers, often cultivated among the ornamental plants of the garden. Every part of it, but more especially the capsule, abounds with a white milky juice, powerfully narcotic, and which, when hardened in the air, forms the *opium* of the shops. The juice is obtained by incisions made in the capsule. For this purpose it is extensively cultivated in Europe, Persia, Turkey and India. Opium acts as a powerful stimulus, followed by narcotic and sedative effects When taken into the stomach it operates directly upon the nervous system, destroying irritability and pain in the most distant parts of the body. In large doses, it immediately induces stupor, followed by delirium, convulsions, apoplexy and death. The use of opium as a stimulant cannot be too much reprobated. It soon becomes an inveterate habit, impairing the digestive organs and consequently weakening the whole body. The memory and all other intellectual powers of its victims soon fail, they become prematurely old, and soon sink into the grave, objects of loathing and pity. June, July. Ann. *Opium Poppy.*

2. P. RHÆAS.

Capsules smooth, nearly round; *stem* many flowered, hairy; *leaves* cut-pinnatifid. Naturalized and cultivated. About 2 feet high. Flowers very

large and showy, of a deep scarlet red. Varieties are produced with various shades of red and particolored flowers, more or less double. June, July. Ann. *Common Red Poppy.*

3. P. ORIENTA'LE.

Capsules smooth; *stems* 1-flowered, rough; *leaves* scabrous, pinnate, serrate. Native of Levant. Stem 3 feet high. Flowers very large and of a rich scarlet color, too brilliant to be looked upon in the sun. June. Per. This, as well as all other species, is of the easiest culture. *Oriental Poppy.*

5. CHRYSE'IS.

Calyx of 2 sepals, cohering by their edges, caducous; petals 4; stamens numerous, adhering to the claws of the petals; stigmas 4—7, sessile, 2—3 of them abortive; capsule pod-shaped, cylindric, 10-striate, many seeded.

Gr. χρυσειος, golden, gilt; in reference to its large golden yellow flowers. Annual herbs with glaucous, pinnatifid leaves. The juice, which is colorless, exhales the odor of muriatic acid.

1. C. CALIFO'RNICA. *Lind.* Eschscholtzia Californica. *Cham.*

Stem branching, leafy; *torus* obconic; *calyx* ovoid with a very short, abrupt acumination; *petals* bright yellow, with an orange spot at base. A very showy annual, common in our gardens. Native of California, Oregon, &c. The foliage is smooth, abundant and rich, divided in a twice or thrice pinnatifid manner into linear segments. Flowers 2 inches broad.

2. C. CRO'CEA. *Lind.* Eschscholtzia crocea. *Cham.*

Stem branching, leafy; *torus* funnel-form, with a much dilated limb; *calyx* obconic, with a long acumination; flowers orange yellow. From California. Leaves and flowers as in the preceding, except the latter are more of a reddish hue. Cultivated.

ORDER XIII. FUMARIACEÆ. *The Fumitory Tribe.*

Fls.—Irregular. *Sep.* 2, deciduous.
Cor.—Hypog. 4-petaled, parallel, one or both of the outer, saccate, 2 inner cohering at apex.
Sta.—6, diadelphous; *fil.* dilated; *anth.* adnate, extrorse, 2 outer, 1-celled, middle, 2-celled.
Ova.—Superior, 1-celled; *sty.* filiform; *stig.* with two or more points.
Fr.—Either an indehiscent nut, 1—2-seeded, or a pod-shaped capsule, many-seeded.
Sds.—Shining, ariled.

A small order, containing several beautiful herbs, inhabiting thickets in the temperate regions of the northern hemisphere. They have generally delicate, brittle stems, with flowers arranged in racemes or cymes, purple, white or yellow. They possess no remarkable action upon the animal economy.

Conspectus of the Genera.

Petals	distinct,	fr. a pod-shaped caps.	*Corydalis*, 3
		only 1 of the outer, sacc. or spurred, fr. a subglobose nut,	*Fumaria*. 4
		2 outer equally saccate or spurred,	*Dielytra* 2
	united, base bigibbous, apex 4-lobed; climbing herbs,		*Adlumia*. 1

1. ADLU'MIA.

Calyx of 2 small sepals; petals 4, united in a fungous monopetalous corolla, persistent, bigibbous at base and 4-lobed

at apex; stamens united in 2 equal sets; pod 2-valved, many-seeded.

Etymology unknown. A tall climbing annual.

A. CIRRHO'SA. *Raf.* Fumaria fungosa. *W.* Corydalis fungosa. *Pers.*

Stem climbing; *leaves* cirrhose; *cymes* nodding, axillary. A delicate climber, native of rocky hills, known in our gardens by the name of Mountain Fringe. Stem striate, many feet in length. Leaves decompound, divided in a pinnate manner, ultimate divisions 3-lobed, smooth, their foot-stalks serving for tendrils Flowers very numerous, in axillary, pendulous cymose clusters, pale pink. Calyx minute. Corolla slightly cordate at base, of 4 petals united into a spongy mass, cylindric, compressed, tapering upwards, 2-lipped. This plant is of very rapid growth, of the easiest culture, and well adapted to the arbour by its abundance of delicate foliage, and its profuse flowering, which continues all summer. Per. *Mountain Fringe.*

2. DIELY'TRA.

Calyx of 2 small sepals; corolla of 4 petals, the two outer equally spurred or gibbous at the base; stamens united in 2 sets of 3 in each; pod 2-valved, many-seeded.

Handsome perennial herbs, of small stature.

1. D. CUCULLA'RIA. *Dec.* Corydalis cucullaria. *Pers.*

Scape naked; *raceme* simple, 1-sided; *spurs* 2, divaricate, as long as the corolla; *style*, included; root tubercled. A smooth, handsome plant, pretty common in the woods of N. H. The root consists of a number of tubercles about the size of peas, and of a bright yellow color, collected together in a scaly sack. *Leaves* radical, a little glaucous, decompound, the last divisions linear oblong, obtuse. The scape bears at top a short raceme of odd-looking flowers, white, tipped with yellow. Calyx minute. Corolla distinguished at sight by the 2 obtuse, diverging spurs. Stam. 3 on each lip. May, Jn. *Dutchman's breeches.*

2. D. CANADE'NSIS. *T. & G.* Corydalis formosa. *P.*

Raceme naked, nodding, many-flowered; *spurs* 2, short, incurved; *style* exserted; root tuberous. This plant resembles the last, but is rather larger and much more beautiful, both in respect to its nodding cluster of rose colored flowers and numerously divided leaves, which are decompound and very glaucous beneath. Flowers larger than in the last, with shorter spurrs. July. *Rose-colored Dielytra.*

3. CORY'ALIS.

Calyx of 2 small leaves; corolla of 4 petals, one of which is spurred at base; stamens 6, diadelphous; pod 2-valved, compressed, many-seeded.

The Greek name for the Fumitory, from which genus this, as well as the two preceding, was taken. Filaments 6, united into 2 equal sets by their broad membranous bases, which sheath the ovary. Small herbs.

1. C. GLAUCA.

Stem erect, branched; *leaves* glaucous, decompound, segments cuneate, 3-cleft; *bracts* linear, minute; *spur* one; *pods* linear, as long as the pedicel.

Found on rocky hills. A smooth, delicate, glaucous plant, about 1 foot high. Root fusiform. The leaves both from the root and stem are variously subdivided, mostly biternate, with smooth leaflets about 3-cleft, and together with the whole plant, covered with a fine glaucous dust. The stem divides above into an irregular panicle, with very curious and delicate flowers. The calyx consists of 2 ovate acuminate leaflets, between which, placed crosswise, is balanced the tubular, ringent corolla with closed mouth, and behind, a single, rounded spur, the whole beautifully colored with alternating shades of light red and yellow, and about half an inch long. On dry rocks, with little soil, the plant is sometimes found with a simple stem, and a single terminal flower. May—Aug. Bienn. *Glaucous Corydalis.*

2. C. AU'REA.

Stem branching, diffuse; *leaves* bipinnated; *leaflets* linear-lanceolate, lobed, acute at each end; *racemes* one-sided, opposite the leaves and terminal; *bracts* lanceolate, 3 times as long as the peduncle. About a foot high, with, finely divided leaves. Flowers yellow, about half as long as the slender, terete, torulose pods which succeed them. May, Aug. Ann. *Golden Corydalis.*

4. FUMA'RIA.

Calyx 2-sepaled; corolla 4-petaled, one of the petals spurred at base; filaments in 2 sets each, with 3 anthers; nut ovate or globose, 1-seeded and valveless.

Lat. *fumus*, smoke, from its disagreeable smell The species are handsome annual weeds. Cal. caducous, inf. Cor. irregular, tubular, spreading at the apex. Fil. as in Corydalis.

F. OFFICINA'LIS.

Stem branching, spreading. *Leaflets* crenate, lanceolate; *capsule* a globose-retuse nut. A small erect plant, common in sandy fields and about gardens. Leaves supra-decompound, the last divisions linear-lobed, dilated upwards. Flowers purple, in rather loose racemes. Pedicels in fruit erect, twice as long as the bracts. July—Aug. Ann. *Fumitory.*

ORDER XIV. CRUCIFERÆ. *The Cruciferous Tribe.*

Cal.—Sepals 4, deciduous.
Cor.—Of 4 regular petals, their claws inserted into the receptacle, and their limbs spreading in the form of a cross.
Sta.—6, 2 of them upon opposite sides shorter than the other 4.
Ova.—Composed of two united carpels with two parietal placentæ, united by a membranous false dissepiment,—*stigmas* two.
Fr.—A silique or silicle usually two-celled.
Sds.—Attached in a single row to each side of the placentæ;—*albumen* 0.
Embryo, with the two cotyledons variously folded on the radicle.

A very natural order, larger than any of the preceding, of an herbaceous habit, with alternate leaves and yellow or white flowers; occasionally a species is found with purple flowers. Of the 900 species included in this order, only 91 are peculiar to this continent. The greater part are found in the Temperate Zones.

Properties. The Cruciferæ as a class are of much importance to man. They furnish several alimentary articles which are very nutricious, as the turnip, cabbage, cauliflower; several others are used as *condiments;* as mustard, radish, cochlearia, &c. They all possess a peculiar acrid, volatile principle dispersed through every part, often accompanied by an etherial oil abounding in sulphur. They are also remarkable for containing more nitrogen than other vegetables, for which reason ammonia is generally evolved in their putrifaction. In medicine they are eminently stimulant and antiscorbutic. None are really poisonous, although very acrid. The root of Isatis tinctoria affords a blue coloring matter.

Conspectus of the Genera.

* Cotyledons accumbent (o=). Seeds generally compressed.

Siliquose: septum linear,	Sds. in one series;	silique terete; calyx bisaccate,		*Cheiranthus.*	10
		silique 4-cornered, lvs. lyrate-pinnatifid,		*Barbarea.*	7
		siliq. with flat valves,	one nerved,	*Arabis.*	4
			nerveless; funicu. slender,	*Cardamine.*	2
			nerveless; funiculus dilated,	*Dentaria.*	5
	Sds. in two series;	valves convex; lvs. pinnately divided,		*Nasturtium.*	6
		valves flat; leaves toothed and entire,		*Turritis.*	8
Siliculose:	Septum broad;	valves semiglob.: stam. toothless: fls. white,		*Cochlearia.*	9
		valves flat,	stamens some of them toothed,	*Alyssum.*	11
			stamens toothless; cal. bisaccate,	*Lunaria.*	12
			stamens toothless; calyx equal,	*Draba.*	3
	Septum linear;	cells many-seeded; valves winged on the back,		*Thlaspi.*	1
		cells one-seeded,		*Iberis.*	11
	Septum transverse;	silicle tomentose, 2-jointed, 2-seeded,		*Cakile.*	13

** Cotyledons incumbent (o‖). Seeds ovate.

Siliquose;	Silique 4-cornered; calyx closed,	*Erysimum.*	15
	Silique roundish; calyx bisaccate; stig. 2, seeds sub-3-angled,	*Hesperis.*	20
	calyx regular,	*Syrimbrium.*	16
Siliculose;	Septum elliptic; valves flat; silicle 1-celled, 1-seeded,	*Isatis.*	22
	valves ventricose; caulescent,	*Camelina.*	17
	valves ventricose; stemless, aquatic,	*Subularia.*	19
	Sep. very narrow; silicle triangular, obcordate,	*Capsella.*	18
	sil. ovate or subcor., [cotyl. sometimes acc..]	*Lepidium.*	21

*** Cotyledons conduplicate (o>>). Seeds globose.

Siliquose;	Sili. transversely many-celled; sds. in a single series; lvs. lyrate,	*Raphanus.*	25
	Silique 2-celled; calyx spreading, style acute,	*Sinapis.*	23
	calyx closed, style obtuse,	*Brassica.*	24
Siliculose;	Silicle 2-jointed, lower loment abortive; upper, globose,	*Crambe.*	26

Tribe 1, PLEUROHIZEÆ.

Cotyledons accumbent (o=). *Radicle lateral. Seeds compressed.*

1. THLASPI.

Silicle compressed, emarginate, many-seeded; valves carinate, often winged; calyx equal at the base.

Gr. θλαω, to compress; because the seed vessels appear as if compressed. Seed-vessel a short, flat, 2-celled, inversely heart-shaped, smooth silicle, crowned with the style.

T. ARVE'NSE.

Leaves oblong-sagittate, coarsely toothed, smooth; *silicle* suborbicular, longer than the pedicel; its wings dilated longitudinally. In cultivated fields. The whole plant smooth, 8—12 inches high, branching. Leaves clasping the stem with their arrow-shaped bases, their margins wavy and toothed. Flowers small, white. Silicles almost round. The plant has a disagreeable flavor of garlic. June. Ann. *Penny Cress.*

2. CARDA'MINE.

Silique linear, with flat, nerveless valves, which often open elastically, and are narrower than the dissepiment; seed not margined, with a slender funiculus.

Gr. καρδια, the heart, δαμαω, to strengthen; from its supposed stomachic qualities. Calyx leaves spreading but little. Stigma entire. A single gland between each of the shorter stamens and the calyx. Margins of the silique truncate.

1. C. HIRSU'TA. *L.* C. Pennsylvanica. *Mh.*

Smooth, branching; *leaves* pinnate, often sublyrate; *leaflets* roundish-oblong, obtuse, angular-toothed; *siliques* erect. In wet places, often submerged except its upper leaves and flowers. Stem 8—12 inches high. Leaves alternate, large, smooth, delicate, of about 7 leaflets. Leaflets rounded at the end, with a few obtuse teeth or entire, the terminal one much the longest. Branches axillary. Flowers white, small. Pods very slender. May—July. Per.

2. C. VIRGI'NICA.

Smooth, erect; *leaves* pinnate, leaflets lanceolate, subauriculate; *silique* long, straight, erect. A small species in wet places, 5—8 inches high. Leaves with a single tooth on one or both sides of the leaflets. Flowers small, white. May. Per. *Virginian Water-Cress.*

3. C. TERES.

Small, erect, ramose; *leaves* all sub-lyrate-pinnatifid; *silique* short, terete, acuminate. Wet places. Stem 6 inches high, roughish. Cauline leaves with 3 or 4 pairs of lobes, of which the terminal one is 3-cleft. Flowers white, minute, in long racemes. June. Per. *Slender Water Cress.*

4. C. BELLIDIFO'LIUM. *L.* C. rotundifolia. *B.*

Leaves suborbicular, nearly entire, smooth, petiolate; *stem* simple, weak, procumbent. A very small plant on the summits of the White Mts. The specimen before me was found in flower in the month of July. The stem is an inch and a half high. Leaves mostly radical, broadly oval and ovate, a fourth of an inch in length, on petioles as long as the stems. Fascicles of 3 or 4 white flowers. Petals oval, obtuse, nearly as long again as the calyx.

3. DRABA.

Silicle entire, oval-oblong, the valves flat or convex; cells 2, many-seeded; seeds not margined; filaments without teeth.

Gr. δραβη, acrid, biting; from the taste of the plant. Flowers white or yellow.

1. D. VERNA.

Scape naked; *leaves* oblong, acute, subserrate, hairy; *petals* bifid; *stigma* sessile. A little early-flowering plant in fields, &c. Leaves all radical, with a few teeth towards the end. Scape a few inches in hight, with a raceme of small white flowers. Calyx spreading. Petals cleft half down. Apr. May. *Whitlow grass.*

2. D. ARA'BISANS. *Mx.* Arabis. *P.*

Stem leafy, somewhat branched and pubescent; *leaves* lanceolate, acutely dentate; *silicle* linear, smooth, longer than the pedicel Among rocks, &c. The silicle is elongated, acuminate, contorted. It may be justly called a silique, and hence Pursh considered this plant an Arabis. May. Bien.

4. A'RABIS.

Silique compressed, linear; valves one-nerved in the middle; seeds in a single row in each cell.

Said to derive its name from Arabia, its native country. A genus well distinguished by its linear, compressed siliques and flat valves. Two of the opposite sepals larger and protuberant at base. Petals a little shorter than calyx, entire. Flowers generally white.

1. A. CANADE'NSIS. *L.* A. falcata. *M.*

Stem leaves sessile, oblong-lanceolate, narrow at base, pubescent; *pedicels* pubescent, reflexed in the fruit; *silique* sub-falcate, nerved, pendulous. On rocky hills. A plant remarkable for its long drooping pods, which resemble a sickle blade, or rather a curved sword blade. Stem 2 or 3 feet high, slender, round, smooth. Leaves scattered, slightly toothed, the lower ones somewhat clasping, upper sessile, with narrow bases. Flowers small, white. Pods slender, flattened, nearly 3 inches long. June, Per. *Sickle-pod.*

2. A. LYRA'TA.

Stem and *upper leaves* smooth and glaucous; *radical leaves* lyrate-pinnatifid, often pilose; *stem* branched at the base; *pedicels* spreading; *silique* erect. On rocky hills. Stems many, united at base, 8 inches high. Stem-leaves narrow, obtuse, tapering at base, the upper ones entire, lower ones with a few teeth, radical ones stalked, and lyrate-toothed at base. Flowers middle size, white. April—July. Bien.

3. A. LEVIGA'TA. *Dc.* Turritis. *L.*

Stem leaves linear oblong, sagittate, smooth, lower ones subdentate, radical ones obovate; *pedicels* erect; *siliques* very long and narrow, at length pendulous. On rocky hills. Stem 2 feet high, simple, round, smooth, its leaves with remote and minute teeth. Flowers white. Pods 1½ inches long. May, Per.

4. A. HIRSU'TA.

Erect, branching; *leaves* mostly dentate, hirsute; *radical ones* oblong-ovate, tapering to a petiole, *cauline ones* oval or lanceolate, sagittate; *siliques* straight, erect. Found at Windsor, Vt. Stems two or more from the same root, round, hairy at base, near a foot high, dividing into very slender and parallel branches. Leaves scarcely dentate, sessile, with heart-shaped or arrow-shaped bases, upper ones acute. Flowers white. June. *Hairy Cress.*

5. DENTA'RIA.

Silique lanceolate, with flat, nerveless, revolute valves, opening elastically; placentæ not winged; funiculus dilated.

Lat. *dens*, a tooth; the rhizoma is furnished with projecting angles which resemble the molar teeth of animals. Cal. converging. Silique dissep. thick and fungous-like. Stig. emarginate. Seeds in a single row, ovate.

1. D. DIPHY'LLA.

Stem two-leaved; *leaflets* ternate, subovate, unequally and incisely dentate; *rhizoma* dentate. In woods and wet meadows. Stem about a foot high, round, smooth, with 2 nearly opposite, ternate leaves above the middle. Leaflets on very short stalks, the lateral ones oblique, all with rounded, mucronate, unequal teeth. Flowers racemed, large, white; the petals much larger than the

calyx. The root-stock is long and large in proportion to the plant, beset with teeth, with a pungent, aromatic taste. May. Per. *Pepper Root.*

2. D. LASCINIA'TA. *Mh.* D. concatinata. *Mx.*

Lvs. 3, 3-parted, the divisions linear-oblong, incisely dentate; *rhizoma* tuberose. In woods. The root-stock consists of connected tubers, of a pungent taste. Stem a foot high, smooth. Leaflets sessile, deeply cut into very irregular mucronate teeth, the lateral leaflets cut nearly to the base, almost rendering the leaves quinate. Flowers racemed, large, purplish. May. Per. *Tooth-wort.*

3. D. MA'XIMA. *N.*

Leaves many, (5—7.) alternate, petiolate, remote; *leaflets* suboval, incisely and acutely dentate; lateral ones lobed; *tubers* concatenate. In western N. Y. Stem 1—2 feet high. Flowers pale purple. Per.

6. NASTU'RTIUM.

Silique subterete, shortish or declinate; valves nerveless; calyx equal, spreading; seeds in a double series.

A latin name, which according to Pliny, comes from *nasus tortus*, from the effect which the acrimony of these plants have upon the nose. Aquatic herbs.

1. N. OFFICINA'LE.

Leaves pinnate; *leaflets* ovate, subcordate, repand. In brooks and ponds. Stems decumbent, a foot high, thick, the branches axillary. Leaves alternate, of 3—7 leaflets; leaflets broad, often cordate at the base, and somewhat acute at the ends, very obtusely toothed, the terminal one the largest. Flowers white. Siliques erect, about half an inch in length. This cress is said to be in great demand in the vicinity of London as a salad. For this purpose it is extensively cultivated in streams of running water, on a chalky bottom. June. Per. *English Water Cress.*

2. N. HIS'PIDUM.

Stem villous; *leaves* somewhat villous, runcinate-pinnatifid; lobes rather obtusely dentate; *siliques* ovate, tumid, pointed with the style, scarcely more than half as long as the pedicels; *petals* scarcely as long as calyx. Stem angular, branched, 2—3 feet high, with many panicled racemes above. Flowers minute. Siliques very short, on somewhat spreading pedicels.

7. BARBA'REA.

Silique columnar, 2 or 4-cornered; valves concave-carinate; seeds in a single series; calyx equal at base, erect.

Gr. ερυω, to cure; from its salutary medicinal effects. Leaves lyrate-pinnatifid. Flowers yellow.

B. VULGA'RIS. *Br.* Erysimum vulg. *L.*

Lower leaves lyrate, the terminal lobe roundish; *upper leaves* obovate, dentate. Found in old fields, also by brooks. Stems 1—2 feet high, smooth, furrowed, branched above. Leaves on clasping stalks, lyrate-pinnate, with large terminal lobes, upper sessile, all with obtuse teeth. Flowers yellow, in terminal racemes. Pods slender, somewhat 4-sided, curved upwards. May—July. Per. *Winter Cress.*

8. TU'RRITIS.

Silique very long, linear, striate, 2-edged; valves keeled or nerved; seeds in a double row; calyx erect, converging; corolla erect.

Lat. *turris*, a tower; the leaves and fruit giving the plant a pyramidal form.

T. GLABRA.

Stem erect; *radical leaves* petiolate, dentate, with ramose hairs; *upper*, broad lanceolate, sagittate, smooth, half-clasping, glaucous; *siliques* narrow, linear, erect; *petals* scarcely longer than the calyx. Stem 1½ feet high, branching. Flowers sulphur yellow, pale. June. Per. *Tower Mustard.*

9. COCHLEA'RIA.

Silicle sessile, oblong or ovate, globose, with ventricose valves; seeds many, not margined; petals entire; stamens without teeth.

Lat. *cochlear*, a spoon, in allusion to the concave leaves, which are hollow like the bowl of a spoon. Flowers white.

1. C. AQUA'TICA. *Ea.*

Leaves all pinnatifid, the lower ones doubly and finely pinnatifid. Grows in wet places, often partly submerged. Flowers white. June. Per. Eaton supposes that it may be a variety of the common horse radish. *Water Horse Radish.*

2. C. ARMORA'CIA.

Pods elliptical; *radical leaves* oblong, crenate; *cauline leaves* long, lanceolate, toothed or cut; root large, fleshy. The horse radish is a garden exotic, cultivated as a condiment for roast beef and other viands. Stem 3 feet high. Flowers white. May. Per. *Horse Radish.*

3. C. OFFICINA'LIS.

Pods oval, globose, half the length of the stalk; *radical leaves* stalked, cordate; cauline ones ovate, angular, dentate. A garden exotic, valuable for its powerful medicinal properties, as antiscorbutic, and stimulating to the digestive organs. Stems less than a foot high. Flowers white, in the spring months. Ann. *Scurvy Grass.*

10. CHEIRA'NTHUS.

Calyx closed; two of the leaflets gibbous at the base; petals dilated; silique when young with a glandular tooth each side; stigma 2-lobed; seed flat, sometimes margined.

Name from the Arabic *kheyry*, the name of a certain plant, and the Greek ανθος, a flower.

1. C. CHEIRI.

Leaves lanceolate, acute, entire, smooth; *branches* angular; *stem* somewhat woody. From S. Europe. A popular garden flower, admired for its various colors and agreeable odor. About 2 feet high. June. Per. *Wall Flower.*

2. C. A'NNUUS.

Leaves lanceolate, subdentate, obtuse hoary; *silique* cylindric, with an acute apex; *stem* somewhat woody. Native of England. A fine garden biennial, with several varieties, as the Brompton Stock, Brompton queens, double-flowered, &c. *Stock July-flower. Ten-weeks Stock.*

3. C. INCA'NUS.

Leaves lanceolate, entire, obtuse, hoary; *silique* truncate, compressed at the apex; *stem* somowhat woody. Native of England. A fine garden biennial, with several varieties. *Purple July-flower.*

4. C. FENISTRA'LIS.

Leaves crowded together in a head, recurved, undulate, downy; *pods* downy, without glands; broadest at base; *stem* erect, somewhat shrubby, simple. Flowers purple. July, Aug. Bien. *Window July-flower.*

5. C. GRAE'CUS.

Stem herbaceous, erect, branched; *leaves* lanceolate, smooth; *pods* somewhat compressed, without glands. From Greece. A garden annual with white flowers. May, June. *Grecian Stock.*

11. ALY'SSUM.

Silicle orbicular or oval, with valves flat or convex in the centre; seeds 2—4 in each cell; calyx equal at base; petals entire; some of the stamens with teeth.

Gr. α, privative, and λυσσα, rage. The plants possessed with the ancients a reputation for allaying anger. Hence their old English name, *Madwort.*

1. A. SAXA'TILE.

Stem half shrubby at base, subcorymbose; *leaves* lanceolate, entire, downy; *silicles* ovate-orbicular, 2 seeded; *seeds* margined. An early flowering garden perennial, native of Candia. Stem a foot high, with numerous yellow flowers in close corymbose bunches. April, May. *Rock Alyssum.*

2. A. MARI'TIMUM.

Stems half shrubby at base and procumbent; *leaves* linear-lanceolate, acute, somewhat hoary; *pods* oval smooth. A sweet scented garden perennial, with fine leaves and small white flowers. Stem a foot in length. Flowers from June to Oct. All the species of Alyssum are of easy culture in common loamy soils. *Sweet Alyssum.*

12. LUNA'RIA.

Silicle pedicellate, eliptical or lanceolate with flat valves, equalling the partition. Calyx of 4, colored, sack-like leaflets.

Lat. *luna*, the moon; from the broad, round silicles.

1. L. REDIVI'VA.

Silicles oval, narrower at both ends; *leaves* with mucromate teeth. *Perennial Satin flower, or Honesty.*

2. L. BIE'NNIS.

Silicles oval, obtuse at both ends; *leaves* with blunt teeth. These are large hairy plants, native of Germany, and naturalized. Stems 3 or 4 feet high. Leaves cordate. Flowers large, lilac-colored. The broad, roundish, silvery silicles are the most remarkable feature of the plants.

13. CAKI'LE.

Silicle 2-jointed, the upper part ovate or ensiform; seed in the upper cell erect, in the lower pendulous.

From the Arabic. Maritime, annual, smooth and fleshy plants. The lower joint of the silicle often abortive.

C. MARI'TIMA.

Upper joint of the silicle ensiform, or ovate-ensiform. Native of the sea-coast and the lake shores of N. Y. Stem prostrate, 6—12 inches long, much branched. Leaves sinnate-dentate, oblong-cuniform. Flowers in axillary and terminal corymbs, purple. July, Aug. *Sea Rocket.*

14. IBE'RIS.

Silicle compressed, truncate, emarginate, the cells 1-seeded; the two outer petals largest.

Prom the country once called *Iberia*, now Spain, where most of the species are native.

1. I. UMBELLA'TA.

Herbaceous, smooth; *leaves* lanceolate, acuminate, lower ones serrate, upper ones entire; *silicles* umbellate, acutely 2 lobed. This and the following species are very popular garden annuals, very pretty in borders, and of easy culture. The *umbellata* is from S. Europe. Stem a foot high. Flowers purple, terminal, in simple umbels, and like the rest of the genus, remarkable for having the two outer petals larger than the two inner ones. June, July. *Purple Candy-tuft.*

2. I. AMA'RA.

Herbaceous; *leaves* lanceolate, acute, somewhat toothed; *flowers* corymbed, becoming racemed; *silicle* obcordate, narrowly emarginate. Native of England. Stem a foot high. Fowers white. June, July. *Bitter Candy-tuft.*

3. I. PINNA'TA.

Herbaceous, smooth; *leaves* pinnatifid; *racemes* corymbose, but little elongated after flowering. From S. Europe. A foot high. Flowers white. Jn. August. *Wing-leaved Candy-tuft.*

4. I. SAXA'TILIS.

Shrubby; *leaves* linear, entire; somewhat fleshy, rather acute, smooth or ciliate; *flowers* in corymbs. From S. Europe. Near a foot high. Flowers white. April, June. *Rock Candy-tuft.*

Twenty-four species of the Iberis have been described, others of which are equally ornamental with those above mentioned.

TRIBE 2, NOTORHIZEÆ.

Cotyledons incumbent (o||). *Radicle dorsal. Seeds ovate, never margined.*

15. ERI'SYMUM.

Silique columnar, 4 cornered; stigma capitate; seeds in a single row; cotyledons oblong, calyx closed.

Gr. ερυω, to cure; on account of its salutary effects in medicine.

E. CHEIRANTHOI'DES.

Pubescence minute, appressed; *leaves* lanceolate, denticulate or entire; *silique* erect, twice as long as the pedicels; *stigma* small. By streams and in wet grounds. Stem often branched, 1 or 2 feet high. Flowers small, yellow. Siliques an inch in length. July, Aug. Ann.

16. SYSI'MBRIUM.

Siliques cylindrical; cotyledons incumbent, sometimes oblique, flat; calyx mostly spreading, equal at the base.

The ancient Greek name of some unknown plant. Stigmas 2, somewhat distinct or connate.

1. S. OFFICINA'LE. Erysimum. *L.*

Siliques close pressed to the rachis of the spike. Leaves runcinate. In cultivated fields, among rubbish, &c. Stem 18 inches high, round, branched, more or less hairy. Leaves lyrate, toothed, the lower segments lanceolate, and placed at right angles to the petiole or pointing backwards; upper leaves in 3 narrow segments, placed at right angles. Flowers small, yellow, terminating the spike, which becomes long and environed with the appressed, sessile pods. June,—Oct. Ann. Medicinal. *Hedge Mustard.*

2. S. SOPHI'A.

Leaves bipinnate; *segments* oblong-linear, incised; *petals* shorter than calyx; *calyx* half as long as pedicel. In sandy fields. Stem 2 feet high. Flowers yellow. April. Ann. *Flax-weed.*

3. S. THALIA'NA. *Gray.* Arabis thaliana. *L.*

Leaves hairy, subdentate; radical ones petiolate, oblong; *stem* branched, hairy at the base; *siliques* ascending, twice as long as the pedicels; *calyx* much shorter than the pedicels. Rocks and dry hills. Stem 6 inches high, erect, with slender branches. Flowers very small. Siliques slender, ¾ inch in length. April, May. Ann. *Mouse-ear Wall Cress.*

17. CAMELI'NA.

Silicle obovate, or subglobose, with ventricose valves and many-seeded cells; style filiform; cotyledons incumbent.

A contraction for *chamae-linum*, dwarf flax. Style rather long. Stamens not toothed. Seeds oblong, striate, not membrane-winged.

C. SATI'VA.

Silicle obovate, pyriform, margined, tipped with the pointed style; *leaves* subentire, lanceolate, sagittate. Grows in fields. Stem straight, erect, 18

inches high, branching. Leaves clasping the stem, with their arrow-shaped bases, the margin nearly entire, tapering to a point. This plant is cultivated in Europe for the seeds, from which an oil is expressed. Flowers yellow. June. Ann. *Madwort. False-flax.*

18. CAPSE'LLA.

Silicle triangular, cunciform; valves boat-shaped, wingless, coriaceous; cells small, many-seeded; cotyledons incumbent.

Name, a diminutive of *capsule*, on account of the little, inversely-heart-shaped silicles. A genus removed from Thlaspi on account of its incumbent cotyledons.

C. BURSA-PASTO'RIS. *Dc.* Thlaspi bursa-pastoris. *L.*

Plant hairy; *silicle* triangular, obcordate, wingless; *cells* many-seeded; radical leaves pinnatifid. The Shepherd's Purse is found every where in pastures and by road sides, flowering from March to Oct. Stem round, branching, from a few inches to a foot high. Root leaves rosulate, hairy, more or less pinnatifid and toothed. Stem leaves much smaller, auriculate at base, sessile. Flowers small, white, in racemes which continue to ascend and put forth new blossoms until the late frosts of Autumn. Silicles smooth, triangular, emarginate at the end, and tipped with the style. Ann. *Shepherd's Purse.*

19. SUBULA'RIA.

Silicle oval; valves turgid; cells many-seeded; stigma sessile; cotyledons linear, curved.

Named in reference to the linear-*subulate* leaves. A small aquatic plant.

S. AQUA'TICA.

The only species. Grows on the muddy shores of ponds, in Maine. *Nutt.* Leaves all radical, an inch in length, awl-shaped. Scape two or three inches high, racemose, with a few minute, white flowers, on slender pedicels one or two lines in length. *Awlwort.*

20. HE'SPERIS.

Calyx closed, furrowed at base, shorter than the claws of the petals; petals bent obliquely, linear or obovate; silique 4-sided, 2-edged or subterete; seeds not margined; stigmas forked, with the apices converging.

Gr. ἑσπερυς, the evening; the flower is more fragrant towards evening.

1. H. MATRIONA'LIS.

Stem simple, erect; *leaves* lanceolate, ovate, denticulate; *petals* emarginate, mucronate; *pedicels* as long as the calyx. A fine garden perennial, said to be found native about Lake Huron. Stem 3 or 4 feet high. Flowers purple; often double and white in β, *hortensis.* *Rocket.*

2. H. APRI'CA.

Stem simple, erect, pubescent; *leaves* oblong, obtuse, entire, ciliate-hispid; *pedicels* as long as calyx. From Siberia. Stem a foot high. Flowers purple. May, June. Per. *Siberian Rocket.*

21. LEPI'DIUM.

Silicle ovate, emarginate; valves carinate, dehiscent; cells 1-seeded; cotyledons incumbent or accumbent.

Gr. λεπις, a scale; the form of the silicles is that of a little scale. Petals obovate. Sepals ovate. Silicle 2 celled, the partition very narrow, crossing the greater diameter. Seeds ovate.

1. L. VIRGI'NICUM.

Leaves linear-lanceolate, incisely serrate, smooth; *stamens* 2—4, silicle orbicular, emarginate; *cotyledons* accumbent; *stem* branched above. In sandy fields, flowering from June to Oct. Stem rigid, round, smooth, a foot high. Flowers and capsules very numerous, in a panicle of racemes. Flower very small, white, diandrous. Radical leaves pinnatifid, the cauline ones narrow, with a few long teeth. Silicles lens-shaped, with a notch at the end. It has a pungent taste like the garden peppergrass. Ann. *Wild Peppergrass.*

2. L. SATI'VUM.

Silicles orbicular, winged; *leaves* variously divided and cut; *branches* without spines. A well known, annual, garden salad, flowering in July. *Common Peppergrass or Cress.*

22. ISA'TIS.

Silicle elliptical, flat, 1-celled, 1-seeded, with carinate, navicular valves, which are scarcely dehiscent.

Gr. ισαζω, to make equal; the plant is believed to remove roughness from the skin. Dissepiment obliterated.

I. TINCTO'RIA.

Silicles cuneate, acuminate at base, somewhat spathulate at the end, very obtuse, 3 times as long as broad. The Woad is native of England. It is occasionally cultivated for the sake of its leaves, which yield a dye that may be substituted for Indigo. The plant grows about four feet high, with large leaves clasping the stem with their broad bases. Flowers yellow, large, in terminal racemes. May—July. Bien. *Woad.*

TRIBE 3, ORTHOPLOCEÆ.

Cotyledons conduplicate, or folded together lengthwise on the radicle (o>>). *Seeds globose, never margined.*

23. SINA'PIS.

Calyx spreading; corolla with straight claws; silique subterete; valves nerved; partition extending beyond the valves and ensiform; seeds in a single row, subglobose; cotyledons conduplicate (folded together.)

Name from the Greek, σιναπι, mustard. Flower always yellow.

1. S. NIGRA.

Silique smooth, 4-cornered, appressed to the rachis of the raceme; upper *leaves* linear, lanceolate, entire, smooth. In cultivated grounds and waste places. Stem 3—6 feet high, branching, smooth, round, striate. Leaves variously lobed and toothed, the upper ones deflexed and entire. Flowers

numerous, yellow. Pods very numerous, 2 inches in length. Seeds well known as a condiment. June, July. Ann. *Black Mustard.*

2. S. ARVE'NSIS.

Silique smooth, many-angled, torose, about 3 times the length of the slender ancipital style; *stem* and *leaves* hairy. In N. York, introduced. Lower leaves large sublyrate-pinnatifid, upper ones oblong-ovate, all repand toothed. Silique somewhat spreading, 1½ inches long. Seeds large and black. Jn. —Aug. Ann. *Charlock.*

3. S. ALBA.

Silique bristly, torose, shorter than the 2-edged beak; *leaves* pinnatifid, upper ones sublyrate, all irregularly dentate; *seeds* large, pale yellow. Native of Europe. The seeds are used for the same purposes as the S. nigra. Both are much esteemed for various medicinal purposes. *White Mustard.*

24. BRA'SSICA.

Silique roundish; style small, short, obtuse; seeds in one row; calyx closed; seeds globose; cotyledons conduplicate.

From the Celtic *bresic*, a cabbage.

1. B. OLERA'CIA.

Leaves with a glaucous dust, somewhat fleshy, repand or lobed, even in their youngest state, and quite smooth. The original plant grows native in England, on rocky shores and cliffs, with no appearance of a head, forming a surprising contrast with the cultivated varieties. The excellence of the Cabbage as a pot-herb needs no encomium. *Common Cabbage.*

2. B. CAMPE'STRIS.

Leaves fleshy, with glaucous bloom, the lower when young, somewhat hisped or ciliate, lyrate dentate, the upper cordate, amplexicaul, acuminate. Root between fusiform and napiform. Native of Sweden. It is cultivated like the common turnip, but, after a thorough experiment, is considered by farmers inferior in value to that root, although it grows to an enormous size. Flowers yellow. June. Bien. *Rutabaga.*

3. B. RAPA.

Radical leaves lyrate, without a glaucous bloom, rough; *cauline leaves* cut; upper ones entire. Root napiform depressed. Bien. *Turnip.*

4. B. NAPUS.

Leaves smooth, upper ones cordate-lanceolate, amplexicaul; lower ones lyrate-toothed. This species is said by Nuttall to grow native on ledges of rocks in Arkansas. Flowers yellow. May. Bien. *Rape.*

25. RA'PHANUS.

Calyx closed, setose; silique torose, terete, not opening by valves, 1 or 2 celled; glands between the short stamens and pistil, and between the long stamens and calyx; cotyledons conduplicate.

Gr. ῥα, quickly, and φαινω, to appear; on account of the rapidity of its growth.

1. R. RAPHANI'STRUM.

Leaves lyrate; *silique* terete, jointed, smooth, 1-celled, becoming at length 2-celled and not jointed. Naturalized in cultivated fields and by road-sides. Stem glaucous, branching, 1 or 2 feet high. The upper leaves are ovate-oblong, toothed. Flowers yellow or light blue, blanching as they grow old. August. *Wild Radish.*

2. R. SATI'VA.

Leaves lyrate; *silique* round, torose, acuminate, scarcely longer than the stalk. A well known salad root from China. It is well grown in gardens with a deep sandy soil. There are many varieties, both with spindle-shaped and turnip-shaped roots, arranged as the spring, summer, turnip, autumn and winter radishes. *Garden Radish.*

26. CRAMBE.

Silicle with 2 joints, of which the lower is abortive, the upper globose, 1-seeded.

One of the ancient Greek names of the cabbage.

C. MARI'TIMA.

The *long filaments* forked; *pod* blunt; *leaves* roundish, sinnate, wavy, toothed, glaucous, and with the stem, quite smooth. Native of England. Cultivated for its early shoots, which are used as a substitute for asparagus. Flowers white. Per. *Sea Cale.*

ORDER XV. CAPPARIDACEÆ. *The Caper Tribe.*

Cal.—Sepals 4.
Cor.—Petals 4, cruciate, unguiculate, hypogynous, more or less unequal.
Sta.—6—12, or some high multiple of 4, almost perigynous.
Tor.—Small, often elongated, bearing a single gland.
Ova.—Often stipitate, of 2 united carpels. *Styles* united into one. *Stigma* discoid.
Fr.—Either pod-shaped and dehiscent, or fleshy and indehiscent. Placentæ usually two.
Sds.—Many, reniform.

A small order of tropical plants. Six genera have been found in N. America. Their properties resemble those of the Cruciferæ. One species of Polanisia, which is the only northern genus, is used as a vermifuge.

POLANI'SIA.

Sepals distinct, spreading; petals 4; stamens 8—32; filaments filiform, or dilated at the summit; torus minute; pod linear.

Annual herbs with a strong odor.

P. GRAVE'OLENS. *Raf.* Cleome dodecandra. *Mx.*

Viscid pubescent; *leaves* ternate; *leaflets* elliptical-oblong; *flowers* axillary, solitary; *stamens* 8—12; *siliques* oblong, attenuate at base. A strong-scented plant, found on sandy shores. Stem a foot high, branching. Flowers reddish white, in terminal racemes, with a variable number of stamens. Pods one-celled, 2-valved, hairy and viscid like every other part of the plant. Jl. Ann.

ORDER XVI. RESEDACEÆ. *The Mignionette Tribe.*

Cal.—Sepals somewhat united at base, unequal, green.
Cor.—Petals lacerated, unequal.
Sta.—8—20, inserted on the disk. Torus hypogynous, one sided, glandular.
Ova.—Sessile. 3-lobed, 1-celled, many-seeded. Placentæ 3, parietal.
Fr.—A capsule, 1-celled, opening between the stigmas before maturity.

A small order inhabiting the countries around the Mediterranean sea, having no very remarkable properties. Reseda luteola contains a yellow coloring matter, and other species are very fragrant. This genus is nearly naturalized in the western part of N. Y.

RESE'DA.

Calyx leaves many, petals of the same number, each bearing one or more stamens; torus large, fleshy, bearing the ovary, with several stamens and styles.

Lat. *resedo*, to calm, to appease; in allusion to the supposed efficacy of the plant in relieving pain.

1. R. LUTE'OLA.

Leaves lanceolate, entire, with a tooth on each side at base; *calyx* 4-cleft. This useful exotic (nearly naturalized in Western N. Y.), affords a most useful yellow dye for cotton, wollen, silk and linen. The yellow color of the paint called Dutch-pink is from this plant. For these purposes the entire plant, when about flowering, is pulled up, and employed both fresh and dried. It is annual, about 2 feet high. The flowers are without petals, arranged in a long spike, which, as Linnæus observes, follows the course of the sun, inclining east, south and west by day, and north by night. *Dyer's Weed.*

2. R. ODORA'TA.

Leaves entire, 3-lobed; *sepals* shorter than petals. A well known and universal favorite of the garden, native of Egypt. The flowers are highly fragrant, and no boquet should be considered complete without it. The variety *fratescens* is by a peculiar training, raised to the height of 2 feet with the form of a tree. The species *phyteuma*, native of Palestine, has a calyx longer than the petals. *Mignionette.*

ORDER XVII. POLYGALACEÆ. *The Milk-wort Tribe.*

Cal.—Sepals 5, very irregular, 3 exterior: 2 interior, larger and petioloid.
Cor.—Petals 3, hypogynous, one larger and anterior, keel-shaped.
Sta.—Hypogynous, 6—8; filaments combined in a tube which is split on the upper side, and coherent to some extent with the claws of the petals.
Ova.—Superior, compressed, 2-celled, one often abortive. *Sty.* curved and often cucullate.
Fr.—Loculicidal or indehiscent. *Seeds* pendulous.

A small order of shrubby or herbaceous plants, very equally distributed, each division of the globe having two or three genera peculiar to it. The properties of the Polygalaceæ have not been well determined. Some of the genera possess a bitter matter and a milky juice which is emetic, expectorant and diuretic. Polygala is the only Northern genus.

POLY'GALA.

Calyx 5-leaved, persistent, 2 of the sepals wing-shaped and colored; vexillum cylindric; capsule obcordate, 2-celled, 2-valved.

Gr. πολυ, much, γαλα, milk. It was said to promote the lacteal secretions

of animals. Cal. inferior, 3 outer leaves smaller, ovate; petals united to the fil. by their claws. The limb of the upper partly divided, the lower keel-shaped, generally crowned with a crested appendage. Fil. united at the base, divided above into 2 sets. Seeds 1 in each cell.

1. P. PAUCIFO'LIA.

Stem simple, erect, naked below; *leaves* ovate, acute, smooth; terminal flowers large, crested, radical, apterous. A small handsome plant, with a few rather large purple flowers. Native of woods and swamps. Stem 3 or 4 inches high, with its acute leaves mostly near the top, 2—4 flowers above them. Calyx of 5 leaves, the upper one gibbous at base. Corolla mostly purple; with a purple crest on its middle lobe. The radical flowers are either close to the ground, or subterraneous, smaller, greenish, wanting the wings of the calyx. May. Per. *Fringed Polygala.*

2. P. POLY'GAMA. *Wr.* P. rubella. *Mh.*

Stems simple, numerous; *leaves* linear, oblong, mucronate, alternate below; *racemes* terminal and lateral; *flowers* sessile, those of the stem winged, those of the root apterous. A plant of a bitter taste, used in medicine as a tonic, found in fields and pastures. Stems crowded, many from the same root, angular, smooth. Leaves smooth, lower obovate, upper linear-lanceolate, obtuse, sessile. Flowers crested, purple, smaller than the last. Wings of the calyx obtuse. Anthers 8, in 2 equal parcels. Bracts small, subulate, caducous. Terminal racemes with perfect flowers, radical racemes prostrate, or subterraneous, wingless and nearly apetalous. Jn., Jl. Per. *Bitter Polygala.*

3. P. PURPU'REA. *N.* P. sanguinea. *Mx.*

Stem branching at the top; *leaves* linear, alternate; *flowers* beardless, in alternate, oblong spikes; calycine wings obovate. An erect plant 6—12 inches high, found in meadows and wet grounds, and known at once by its short, reddish, cylindric spikes of flowers. Stem angular, with fastigiate branches, each ending in a smaller spike than that of the main stem, but rising above it in hight. Flowers purple, caducous. Jl.—Oct. Ann. *Caducous Polygala.*

4. P. SE'NEGA.

Stem erect, smooth, simple, leafy; *leaves* alternate, lanceolate, tapering upwards; *flowers* slightly crested, in a terminal spike. A plant much valued in medicine, said to have been employed by the Seneca Indians as an antidote to the bite of the rattle-snake. The root is woody, branched, contorted, about half an inch thick, covered with ash colored bark. Stems about a foot high, with numerous, scattered, subsessile, lanceolate leaves. Flowers white, in a long, filiform spike. Calyx larger than the corolla, 5-leaved, colored. The root has at first a sweetish and nauseous taste, which soon becomes pungent and hot, producing a peculiar tingling sensation. Jl. Per. *Seneca Snake-Root.*

5. P. VERTICILLA'TA.

Stem branched, erect; *leaves* linear, verticillate; *spikes* linear, stalked; *flowers* alternate, crested; calycine wings roundish. Found on dry hills. Stem very slender, square, 6—8 inches high. Leaves in whorls of 5 or 6. Flowers small, greenish white, in very slender spikes, which are higher upon the branches than upon the main stem. Jl.—Oct. Ann. *Whorled-leaved Polygala.*

6. P. CRUCIA'TA.

Stem erect, somewhat fastigiate, winged at the angles; *leaves* in 4s, linear-lanceolate; *hds.* of flowers spiked, sessile. Sphagnous swamps and other low

grounds. Stem about a foot high, with 4, winged angles and opposite branches. Leaves linear-oblong, obtuse, smooth, with obscure resinous dots. Calycine wings cordate, acute, purple. Corolla beardless, greenish purple. Jl. Aug. Ann. *Cross-leaved Polygala.*

ORDER XVIII. VIOLACEÆ. *The Violet Tribe.*

Cal.—Sepals 5, persistent, slightly united, elongated at base, the two lateral interior.
Cor.—Petals 5, commonly unequal, the inferior usually spurred at base.
Sta.—5, inserted on the hypogynous disk. *Fil.* dilated, prolonged beyond the *anthers.*
Ova.—Of 3 united carpels, with 3 parietal placentæ. *Sty.* 1, declinate. *Stig.* cucullate.
Fr.—A 3-valved capsule. *Sds.* many, with a crustaceous testa and distinct chalaza.

A small order of shrubs and herbs, mostly inhabitants of the Northern Temperate Zone. The roots of almost all the Violaceæ possess emetic properties, and some are valued in medicine. The Ipecac of the shops is partly the product of certain Brazilian species of Ionidium. Several species of the violet are cultivated for the beauty of their flowers. Of the 4 genera found in N. America only 2 are found in the Northern States.

Genera.

Sepals unequal, more or less auricled at base, ... *Viola.* 1
Sepals nearly equal, not auricled, ... *Solea.* 2

1. VI'OLA.

Sepals 5, unequal, auricular at base; corolla of 5 petals, irregular, the upper one spurred at base; anther connate, the lobes diverging at base; capsule 1-celled, 3-valved.

The Greek name of this beautiful genus is ιον, from Ιω, the name of a certain cow, which according to a ridiculous fable fed upon the *Violet.* Cal. of 5 oblong, acute, equal, erect sepals, produced downwards beyond their insertion, 2 of them under the uppermost petal, one under each lateral petal, and one under the two lower. Cor. irregular, the upper petal broadest, slightly cleft, ending at base in a curved spur projecting between the leaves of the calyx; two lateral petals opposite, equal, obtuse. Seeds several in each cell, attached to the valves. Low, herbaceous, perennial plants, with a short subterraneous stem or rhizoma, or caulescent. Peduncles angular, solitary, 1-flowered, recurved at the summit, so as to bear the flower in a resupinate position.

* Acaulescent. Flowers blue.

1. V. SELKI'RKII. *Goldie.*

Leaves cordate, crenately serrate, minutely hirsute above, smooth beneath, the sinus deep and nearly closed; *stigma* triangular, margined, distinctly beaked; *spur* nearly as long as the lamina, thick, very obtuse. Grows on woody hills and mountains. A small stemless violet, with small pale blue flowers conspicuously spurred. The radical heart-shaped leaves are rather numerous and longer than the peduncles. The lateral petals bearded, and with the upper one striate with deep blue. *Selkirk's Violet.*

2. V. CUCULLA'TA.

Very smooth; *leaves* cordate, cucullate at base, crenate; stipules linear; inferior and lateral petals bearded. This is one of the more common kinds of violet, found in low, grassy grounds. Leaves on long petioles heart-shaped, remarkably rolled at the base into a hooded form. The late leaves are crenate-reniform. Flowers light blue or purple, with scapes somewhat 4-sided, longer

than the leaves. Petals twisted, veiny, entire, white at the base, the lateral and upper ones marked with a few blue striæ, very variable in respect to pubescence. May. Per. *Hood-leaved Violet.*

3. V. PALMA'TA.

Pubescent; *leaves* cordate, lobed in a hastate or palmate manner, the lobes crenate and toothed, the middle one much the largest, lateral petals bearded. In upland pastures; 3—6 inches high. Root-stalk scaly. Petioles hairy. The early leaves are ovate, entire. The later and perfect are pubescent, often purple beneath, variously lobed and cleft; the middle lobe always the largest and longest, with 2 or 3 lateral ones each side. Peduncle sub-4-angled, longer than the leaves. Stipules lanceolate. Petals purple, entire, veiny, white at the base, upper ones smaller, lateral ones densely bearded, and marked with blue striæ. May. Per. *Palmated Violet.*

4. V. PEDA'TA. *L.*

Leaves pedate, 5—9-parted; *segments* linear-lanceolate, entire, glabrous. A species very distinct from all others, with large blue flowers, pedate leaves and a premose root, found in dry woods and pastures. Root-stalk fleshy, ending abruptly as if cut or bitten off. Leaves a fine example of the pedate form, being divided into about 7 obtuse segments. Petioles furnished with long, ciliate stipules at base. Peduncles sub-4-angled, much longer than the leaves. Petals pale blue, white at base, all of them beardless and entire. Calyx segments long, linear, entire. Stigma large, obliquely truncate and perforate at the apex. May. Per. *Pedate Violet.*

5. V. OVA'TA. *N.*

Leaves ovate, crenate, pubescent, often cut-toothed at the base; *petiole* margined. Found on dry hills, Apr.—May, with numerous pale purple flowers. The leaves are hairy on both sides, subcordate, upper ones lacerately toothed at the base, and on shortish petioles. Calyx segments ovate, ciliate, deeply emarginate behind. Petals entire, veiny, white at base, the lateral ones bearded. Stigma recurved, beaked. Spur broad, usually lengthened. Per. *Ovate-leaved Violet.*

6. V. ASARIFO'LIA. *P.*

Villose; *leaves* very large, subovate-reniform, crenate, dentate, decurrent into the petioles, always entire; *peduncle* somewhat 4-sided, short, (rarely an inch and a half;) *divisions* of the calyx ovate, ciliate, entire or emarginate behind; *petals* all very entire, veiny, white at the base; upper one smooth, naked; lateral ones densely bearded; and with the upper one, marked with a few blue lines. *Le Conte.* Woods, Lebanon, N. H. May. Per. *Kidney-leaved Violet.*

7. V. SAGITTA'TA. *A.*

Leaves oblong, sagittate-cordate, serrate, gash-toothed at the base, mostly smooth; *peduncles* longer than leaves. On dry hills, with dark purple flowers. The plant is generally smooth, but varieties are mentioned with downy leaves. Leaves vary in form, oval, ovate or lanceolate, serrate or toothed, acute or not, with large divergent teeth at base. Calyx segments lanceolate, acute, emarginate behind. Petals entire, veiny, white at base, lower and lateral ones densely bearded. Flower-stalks obscurely 4-sided. Apr. Jn. Per. *Arrow-leaved Violet.*

** Acaulescent. Flowers white, somewhat regular.

8. V. BLANDA. *W.*

Leaves broad-cordate, slightly pubescent above; *petiole* pubescent; *flowers* white. Found in meadows. The rhizoma is slender and creeping. Leaves close to the earth, nearly round, cordate or ovate, and sometimes with a rounded sinus, so as to appear reniform. Petioles half-round. Peduncles sub-4-sided, longer than the leaves. Petals white, greenish at base, upper and lateral ones marked with a few blue lines, generally beardless. Flowers small, fragrant. May. Per. *Sweet Violet.*

9. V. LANCEOLA'TA. *L.*

Leaves smooth, lanceolate, narrowed at base into the petiole, obtusish, subcrenate. Found in wet meadows. Rhizoma creeping. Leaves very narrow, and, with the stalk, 3—5 inches long. Petioles half-round. Peduncles sub-4-sided. Petals white, greenish at base, upper and lateral ones marked with blue lines, generally beardless. Flowers small. May. Per.
Spear leaved White Violet.

10. V. PRIMULÆFO'LIA. *L.* V. acuta. *B.*

Leaves lance-ovate, abruptly decurrent at base; *bracts* lance-linear; *petals* acute, nearly equal, beardless. Found in damp soil. Rhizoma creeping. Leaves sometimes subcordate, rather obtuse, mostly smooth, longer than their stalks. Petals obovate, acute, flat, marked with purple lines at base, generally beardless, as long as the bracts. Flowers small, white, on sub-4-sided stalks. May. Per.

*** Acaulescent. Flowers yellow.

11. V. ROTUNDIFO'LIA.

Leaves orbicular-ovate, cordate, slightly serrate, nearly smooth, with the sinus closed: *petiole* pubescent: *calyx* obtuse. A small yellow violet found in woods, May. Per. Leaves nearly round, with a deep, narrow sinus at base, obscurely and remotely serrated. Nerves and petiole pubescent. Peduncles as long as the claws, sub-4-sided, bracted in the middle. Petals yellow, marked at base with brown lines. Flowers small.
Round-leaved Yellow Violet.

† Caulescent.

12. V. CANADE'NSIS.

Smooth; *leaves* cordate, acuminate, serrate; *peduncles* shorter than the leaves; *stipules* short, entire. A large species, often a foot in height, found in woods. Stem sub-simple, terete, with lance-ovate, membranaceous stipules. Leaves alternate, the lower on very long petioles, acute or obtuse. Peduncles sub-4-sided, terminal, with minute bracts. Flowers large, nearly regular. Petals white or light-blue, yellowish at base, the upper ones purple without, and marked with blue lines. Lateral ones bearded. Flowering all summer. Per. *Canadian Violet.*

13. V. PUBE'SCENS. *A.*

Villous-pubescent; *stem* erect, naked below; *leaves* broad cordate, toothed; *stipules* ovate, subdentate. A large yellow violet, found in dry, stony woods. Root fibrous. Stem simple, more or less pubescent, somewhat triangular and fleshy, bearing a few leaves at the top, leafless below. Leaves broad, ovate, cordate or deltoid, obscurely dentate, obtuse, on short stalks. Stipules large,

ovate, wavy. Flower-stalks rather shorter than leaves, downy, axillary, solitary, with 2 subulate bracts. Petals yellow, lateral ones bearded, and with the upper one marked with a few brown lines. The plant varies in pubescence, sometimes even glabrous. Height very variable, from 5 to 20 inches. May, Jn. Per. *Common Yellow Violet.*

14. V. MUHLENBE'RGHII. *Tor.* V. debilis. *M.*

Stem weak, assurgent; *leaves* reniform-cordate, upper ones crenate, rather acuminate; *stipules* lanceolate, serrate-ciliate. A spreading, slender species, in swamps, &c. Stems branched below, 6—8 inches long, with large stipules cut into fringe-like serratures. Younger leaves involute at base. Petioles longer than the leaves, and shorter than the axillary peduncles. Bracts linear, alternate, on the upper part of the stalk. Petals entire, pale purple, the lateral ones bearded. Spur porrected, very obtuse. Stigma rostrate. May. Per. *Muhlenbergh's Violet.*

15. V. ROSTRA'TA.

Smooth; *stem* terete, diffuse, erect; *leaves* cordate, roundish, serrate, upper ones acute; *stipules* lanceolate, deeply fringed; *petals* beardless; *spur* longer than the corolla. A common violet in moist woods, well characterized by its long, straight, linear, obtuse nectary, which renders the large flowers similar to those of the Larkspur. Stem 6—8 inches high, branching below. Petioles much longer than the leaves. Stipules almost pinnatifid. Peduncles slender, very long, axillary. Flowers pale blue. May. Per. *Beaked Violet.*

16. V. STRIA'TA.

Smooth; *stem* branching, nearly erect; *leaves* roundish, ovate, crenate-dentate; *stipules* large, ciliate-toothed; *spur* sub-porrected. In rocky woods. Stem 6—12 inches high; half-round. Leaves often sub-pubescent. Stipules lance-linear, large. Petioles long. Peduncles longer than the leaves. Petals white, streaked with blue, lateral ones bearded. Resembles V. Canadensis, but sufficiently distinct in the form of the leaves and the nectary. Jn. Per. *Striped Violet.*

17. V. TRICO'LOR.

Stem angular, diffuse; *leaves* oblong, deeply crenate; *stipules* lyrate, pinnatifid. This pretty flower is found in all cultivated grounds, and especially in the garden. Its flowers are among the earliest of spring, and continue to expand through the summer and autumn. Stems more or less branched, very variable in luxuriance. Stipules deeply pinnatifid, the terminal segment largest, ovate, crenate. Flowers variable in size. The 2 upper petals purple, the lateral ones whitish, veined with purple, and the lower one yellow, obcordate, with purple veins, ending behind in a short spur.
Garden Violet. Pansy. Hearts-ease.

18. V. ODORA'TA.

Stemless; *scions* creeping; *leaves* cordate, crenate, nearly smooth; *calyx* obtuse; *lateral petals* with a hairy line. This species is cultivated and exotic. It is well characterized by its long, trailing, leafy runners. The leaves are truly heart-shaped. Stipules lanceolate, toothed. Flower-stalks longer than the leaves, bracted. Flowers large, of the true *violet* color, fragrant. There are several varieties, distinguished by the form and color of the flowers: viz. the *purple*, *white* and *blue-flowered*, the *double-purple*, *double-white* and *double-blue*-flowered, and the *Neapolitan*, with pale-blue flowers. Apr., May. Per. *Sweet Violet.*

2. SO'LEA.

Sepals nearly equal, not auriculate; petals unequal, the lowest 2-lobed and gibbous at base; the rest emarginate. Stamens cohering, the lowest 2 bearing a gland above the middle capsule, surrounded at base by the concave torus; seeds 6—8, very large.

S. CO'NCOLOR. *Gingins.* Viola concolor. *Forst.*

Straight, erect; *leaves* broad lanceolate, subentire; *stipules* subulate; *peduncles* short. In woods, N. Y. Stem 1 or 2 feet high, and with the leaves somewhat hairy. Flowers greenish white, spur none. Capsule near an inch long. Apr. May. Per. *Green Violet.*

ORDER XIX. DROSERACEÆ. *The Sun-dew Tribe.*

Cal.—Sepals 5, persistent, equal, with an imbricate æstivation.
Cor.—Petals 5, hypogynous, marescent.
Sta.—Distinct, marescent, usually equal in number to the petals.
Ova.—Single. *Styles* 3—5, either wholly distinct or slightly united, bifid or branched.
Fr.—A capsule, 1—3-celled, usually many-seeded. *Sds.* sometimes arilled.

A very small order of delicate herbaceous plants, scattered over the whole globe, wherever marshes are found. Their leaves are usually furnished with glandular hairs, and are entire, alternate or crowded. Attached to this order is the Genus Parnassia, regarded by some as forming a separate order. It is variously located by different botanists. We follow Torrey and Gray, after DeCandolle, in placing it here. Some peculiarity exists in the arrangement and structure of the stamens in this genus, which will be mentioned further on.

No remarkable properties have been discovered belonging to plants of this order.

Genera.

Stamens	hypogynous, all perfect and	5 in number, styles 3—5 . .	*Drosera.* 2
		10—15 in number, style 1, . .	*Drionæa.* 3
	perigy. inner row 5 perf. ones, outer row 5 groups of imperf. ones,		*Parnassia.* 1

1. PARNA'SSIA.

Calyx of 5 persistent sepals, united at base; corolla of 5 persistent, nearly perigynous petals; stamens perigynous in 2 series, the outer indefinite in number, united in 5 groups, sterile, the inner of 5 futile stamens; capsule 1-celled, 4-valved; seeds very numerous with a winged testa.

Named from Mt. Parnassus, the abode of grace and beauty, where this plant, on account of its singular elegance, is feigned to have first sprung up. Handsome perennial herbs, with radical leaves and 1-flowered scapes.

P. CAROLINIA'NA.

Sterile filaments in 5 clusters, 3 in each, distinct to near the base, surmounted with little spherical heads; *petals* much exceeding the calyx, marked with green veins; *leaves* radical, or sessile on the scape, broad-oval, with no sinus at base. An exceedingly elegant and interesting plant, growing in wet meadows, borders of streams, &c. Root fibrous. Leaves about 7-nerved, broad-oval or ovate, smooth, leathery, radical ones long-stalked, cauline ones sessile, clasping, a few inches above the root. Scapes about a foot high, with a handsome regular flower about an inch in diameter. Jl. Aug.

Grass of Parnassus.

2. DRO'SERA.

Calyx of 5 sepals united at base, persistent; petals 5; anthers adnate; styles 6, capsules superior, 1-celled, 3—5-valved, many-seeded.

Gr. δροσος, dew; on account of the dew-like drops of viscous matter on the glandular hairs of the leaves. Hence also its English name. Small aquatic herbs.

1. D. ROTUNDIFO'LIA.

Leaves radical, nearly round, depressed; *petioles* hairy; *scape* erect, bearing a simple raceme. This little curious plant is not uncommon in bogs and muddy shores of ponds and rivers. It is at once distinguished by the reddish, glandular hairs with which the leaves are beset, and which are usually tipped with a small drop of a clammy fluid, appearing like dew glistening in the sun. Leaves small, lying flat on the ground, narrowed into the elongated petiole. Scape about 5 inches high, at first coiled inward. Flowers arranged on one side, very small, white. Aug. Per. *Sun-dew.*

2. D. LONGIFO'LIA.

Leaves radical, spathulate and obovate, tapering at base into a long, smooth petiole; *scape* bearing a simple raceme. A more slender and delicate species, in similar situations with the last. Leaves slender, ascending, cuneiate-oblong, crenate, numerous, beset with dewy hairs. Scape ascending at base, bearing a cluster of small, yellowish white flowers, and arising from 3—8 inches. Jn. —Aug. Per. *Long-leaved Sun-dew.*

3. D. FILIFO'RMIS.

Leaves filiform, berry long; *scape* nearly simple, longer than the leaves, many-flowered; *petals* obovate, erosely denticulate, longer than the glandular calyx; *styles* 2-parted to the base. Grows in wet, sandy places. Much larger than the preceding species. The leaves seem destitute of a lamina, are suberect, nearly as long as the scape, beset with glandular hairs, except near the base. Scape about a foot high, with largish purple flowers. Aug. Sept. Per. *Linear Sun-dew.*

3. DIONÆ'A.

Stamens 10—15; style 1; stigmas 5; connivent, many-cleft; capsules indehiscent, opening irregularly, 1-celled; seeds numerous.

Dionæa is one of the names of Venus. Sep. ovate, oblong, spreading. Pet. obovate, with pellucid ribs in their lower part.

D. MUSCI'PULA.

The leaves of this plant chiefly distinguish it, and are of a very singular structure; the petiole is winged; the proper leaf is 2-lobed. A gland within the lobes secretes a sweet liquor, which is attractive to flies. The edges of the leaf are furnished with long spines, and there are three others within the cavity, upon each lobe, and such is the remarkable irritability of the plant, that if a fly or other insect alights upon the leaves, or if they be touched with a pin, they instantly close and retain the irritating object. Hence the specific name, *muscipula*, a fly-trap. Native of wet grounds in the Southern States. Cultivated in a pot of bog earth, placed in a pan of water. *Venus' Fly-trap.*

ORDER XX. CISTACEÆ.

Cal.—Sepals 5, unequal, the 3 inner with a twisted æstivation.
Cor.—Petals 5, hypogynous, very fugitive, crumpled in æstivation.
Sta.—Indefinite, hypogynous, distinct. *Anthers* innate.
Ova.—Distinct, or many-celled. *Style* single. *Stigma* simple.
Fr.—Capsular, either 1-celled with parietal placentæ, or imperfectly 3—5-celled, with dissepiments proceeding from the middle of the valves.

A small order of herbs or low shrubs, found most abundantly in the North of Africa or South of Europe. They possess no interest on account of their properties.

Petals 3, lanceolate,		*Lechea.*	1
Petals 5;	Calyx 3 equal sepals, or 5 in two rows, 2 outer smaller,	*Helianthemum.*	2
	Calyx 5 parted, segments unequal, the 2 outer minute.	*Hudsonia.*	3

1. LE'CHEA.

Calyx three sepaled, inferior; corolla three petaled, petals linear; capsule 3 celled, 3-valved, with 3 smaller valves within; stigmas 3, plumose; seed one.

Name in memory of G. Lecheo, a Swede, professor of natural history at Abo, and a botanic author.

1. L. MAJOR.

Erect, hairy; *leaves* oblong-lanceolate; *flowers* in fascicled racemes, one sided on short pedicels; *stem* from one to two feet high, rigid, brittle, hairy, purple; *leaves* downy, whitish underneath; *flowers* small, obscure, in dense, terminal and lateral bunches; *capsules* roundish, of the size of a large pin's head. Dry woods. Jl. Aug. Per. *Large Pin-weed.*

2. L. MINOR.

Smoothish; *leaves* linear-lanceolate, acute; *panicle* leafy, its branches elongated, flowering on all its parts. Stems about 8 inches high, slender, with numerous, simple, expanding branches and narrow leaves; *flowers* minute; *capsule* not longer than a pin's head, round. Grows in dry sandy grounds. Jl. Aug. Per. *Small Pin-weed.*

3. L. THYMIFO'LIA. *P.*

Frutescent; *stems* decumbent at base, densely branched, hoary with appressed hairs, and very leafy; *root leaves* on the short radical branches, imbricated, elliptical, very small; cauline leaves linear or oblanceolate, often whorled. Flowers in terminal and axillary racemes, on very short pedicels. Stem about a foot high, rigid and very bushy. Sea coast. Jl.—Sept. Per. *Thyme-leaved Pin-weed.*

2. HELIA'NTHEMUM.

Calyx 5-leaved; exterior leaflets smaller; petals 5; capsule superior, 1-celled, 3-valved, opening at top; seeds angular.

Gr. ηλιος, the sun, and ανθος, a flower; in allusion to the bright golden radiance of the blossoms. Cal. of 5 roundish, concave leaves. Pet. roundish, flat, spreading. Stam. numerous, shorter than cor. Style long as stamens. A genus separated from *Cistus.*

H. CANADE'NSE. *M.* Cistus Canadensis. *L.*

Without stipules, erect, hairy; *leaves* linear-lanceolate, erect, flat, paler beneath; *raceme* terminal, few-flowered; *capsule* shorter than the calyx.

Plant about a foot high, found in dry fields and woods. It has small and nearly sessile leaves, with solitary, lateral, yellow flowers near the top, which are very deciduous. This plant, according to Eaton, is remarkable for the thin, fibrous, curved ice-crystals which it shoots out near the roots, in the late autumn months. *Frost plant. Rock Rose.*

3. HUDSO'NIA.

Calyx 3-parted tubular; petals 5; capsule 1-celled, three-valved, three-seeded.

In honor of Wm. Hudson, a correspondent of Linnæus, and author of Flora Anglica. Cal. inferior, of one leaf, unequally 5-parted, 2 of the divisions obsolete, colored. Stam. 15 to 30. Caps. 1 to 3 seeded.

1. H. TOMENTO'SA. *N.*

Hoary-tomentose; *leaves* ovate, imbricate, shorter than the intervals of the stem; *flowers* subsessile; *calyx* obtuse. Grows upon the sea-shore. The whole plant covered with a whitish down. Stem and branches with numerous, minute leaves. Flowers lateral, small, yellow. Jl. *Downy Hudsonia.*

2. H. ERICOI'DES.

Leaves acerose-subulate; *peduncles* filiform, hairy. A very delicate shrub, found in pine barrens. Stem half a foot high, procumbent, round, with many short, compound branches. Leaves needle-like, scattered, appressed to the stem, minute. Flowers lateral, yellow, the stalks longer than the leaves. Jn. *False Heath.*

ORDER XXI. HYPERICACEÆ.

Cal.—Sepals 4—5, distinct or cohering, persistent, unequal, dotted.
Cor.—Petals 4—5, hypogynous, æstivation twisted, veins oblique, dotted.
Sta.—Hypogynous, indefinite, in 3 or more parcels, *Anthers* versatile.
Ova.—Single, superior. *Styles* slender. *Stigma* simple.
Fr.—A capsule or berry, many-celled. *Seeds* indefinite, minute.

A small order very generally distributed, presenting a very great variety in habit, and flourishing in all kinds of localities. The juice of many species is considered purgative and febrifugal.

Genera.

Triadelphous: the parcels alternating with 3 hypogynous glands, . .	*Elodea.*	1
Triadelphous or polyadelphous; without any glands, ...	*Hypericum.*	2

1. ELO'DEA.

Sepals 5, equal, somewhat united at the base; petals five, deciduous, equilateral; stamens 9, triadelphous, the parcels alternating with 3 hopogynous glands; styles three, distinct; capsule 3-celled.

Perennial herbs, with pellucid-punctate leaves, the axils leafless.

E. VIRGI'NICUM. *N.* Hypericum Virginicum. *L.*

Flowers with 9 stamens, in 3 distinct sets, with nectariferous glands between each set; *styles* 3; *leaves* elliptical, obtuse, subcordate, clasping; *stem* herbaceous, compressed. The leaves of this species are much larger than any of the foregoing, except the first. Stem and leaves reddish, about a foot high.

Grows in swamps. Leaves opposite, oblong-ovate, very obtuse, the upper ones elliptical, all paler beneath. Flowers middle size, reddish yellow, on axillary and terminal peduncles. The whole plant often presents a reddish hue. Jl.—Sept. *St. John's-wort.*

2. HYPE'RICUM.

Sepals 5, connected at base, sub-equal, leaf-like; petals 5 oblique; stamens very numerous (sometimes few,) united at base into 3—5 parcels, with no glands between them; styles 3—5, distinct or united at base, persistent.

Herbaceous and shrubby plants, with yellow flowers in cymose panicles or solitary. Leaves punctate with pellucid dots, opposite, entire and without stipules.

1. H. PYRAMIDA'TUM. *Ait.* H. ascyroides. *W.*

Flowers pentagynous, terminal; *stem* branching, somewhat 4-sided; *leaves* sessile, oblong, acute, smooth; *styles* as long as the stamens. A tall species, with large flowers, found on dry hills at Royalton and Burlington, Vt., Potsdam, N.Y., &c. Stem scarcely 4-sided, smooth, rigid, branching, 3—5 feet high. It is occasionally simple. Leaves opposite, those of the branches smaller, all smooth, sessile or somewhat clasping, acute but not pointed, oblong-ovate. Flowers yellow, as well as those of all the other species. Petals broad-ovate, near an inch in length. Stamens very numerous, hair-like. Capsules very large, ovate, pointed, tipped with the 3 styles. Seeds in 5 cells, very numerous. Jl. Aug. Per. *Giant Hypericum.*

2. H. PERFORA'TUM.

Flowers with 3 styles; *stem* 2-edged; *leaves* elliptical, with pellucid dots; *segments* of the calyx lanceolate. A hardy weed prevailing in pastures and dry soil, much to the annoyance of farmers. Stem from 1 to 2 feet high, brachiate, erect, round, with 2 elevated lines, opposite, extending from the insertion of the branches. Leaves opposite, entire, oblong, obtusish, covered over with dots, which may best be seen by transmitted light. Flowers numerous, bright yellow, with purple lines, in terminal panicles. Petals and calyx bordered with fine dark-colored glands. Jn. Jl. Per. *Common St. John's wort.*

3. H. CORYMBO'SUM.

Flowers with three styles, dotted; *stem* erect, round, smooth, branching; *leaves* clasping, oblong-oval, obtuse, with black dots; *corymbs* terminal, brachiate, dense-flowered; *calyx segments* lanceolate. Found in wet meadows and damp woods. Stem 2 feet high, with larger leaves than the common St. John's wort. Flowers small, numerous, pale yellow. The sessile leaves, as well as every other part of the plant, are thickly covered with black dots. Jn. Jl. Per. *Spotted St. John's wort.*

4. H. CANADE'NSE.

Stem erect and straight, 4-winged; *leaves* linear; alternate at the base, rather obtuse; *panicle* dichotomous; *calyx* segments lanceolate; *styles* 3, very short; *capsule* conical. Sandy soils, about a foot high. Stem roundish, with 4 prominent lines. Lower branches opposite, the upper pair forked. Flowers minute, yellow, axillary and terminal. Capsules red, the narrow leaves of this species are also punctate and naked, marked with black dots beneath. Jl., Aug. *Canadian St. John's wort.*

5. H. MU'TILUM. *L.* H. parviflorum. *Mh.*

Stem erect, dichotomous-ramose, somewhat 4-winged; *leaves* obtuse, ovate-oblong, subcordate, sessile, nerved; *flowers* in leafy cymes; *petals* shorter than calyx; *styles* 3. Damp, sandy soils. Stem a few inches high, with minute, yellow flowers. Jl. Aug. Ann. *Small-flowered St. John's wort.*

6. H. KALMIA'NUM.

Stem corymbosely branched; *branches* somewhat 4-sided, two of the angles slightly winged; *leaves* linear-lanceolate, very numerous, obtuse, alternate at base; *cymes* 3—7-flowered, fastigiate; *sepals* half as long as petals. Rocks below Niagara Falls, &c. A shrubby species a foot or more in height. Leaves an inch in length, slightly revolute on the margin, 1-nerved, minutely and thickly punctate, sessile. Branches slender and delicate. Flowers yellow. Stamens very numerous. Aug. *Kalm's St. John's wort.*

7. H. SARO'THRA. *Mx.* Sarothra gentianoides. *L.*

Stem and *branches* filiform, quadrangular; *leaves* very minute, subulate; *flowers* sessile. Dry fields and road sides. Stem 4—8 inches high, branched above into numerous very slender, upright, parallel branches, apparently leafless from the minuteness of the leaves. Flowers very small, yellow, succeeded by a conical brown capsule, which is twice the length of the sepals. Jl. Aug. *Pine weed.*

ORDER XXIII. ILLECEBRACEÆ.

Cal.—Sepals 5, distinct or coherent at base, persistent.
Cor.—Petals minute, inserted between the segments of the calyx, often wanting.
Sta.—Equal in number to sepals, sometimes less or more, inserted into the perigynous disk.
Ova.—Superior, 1-celled. Styles 2—5, either partially distinct or wholly combined.
Fr.—A utricle. *Seeds* solitary, attached to base of cell, or a many-seeded capsule.

A middling sized order of herbaceous or half-shrubby plants, found mostly around the Mediterranean. Seven genera have been found in North America. A slight astringency is the only property possessed by them.

Genera.

Petals none. Stamens inserted on the base of the sepals. Fruit an utricle, *Anychia.* 1
Petals 5. Stamens inverted, with petals between the sepals. Fruit capsular. *Spergula.* 2

1. ANY'CHIA.

Calyx of 5 ovate-oblong, connivent sepals, callous, subsaccate at the apex; corolla 0; filaments 2—5, distinct; stigma, subcapitate; utricle enclosed by the sepals of the calyx.

Gr. ονυξ, the nail; because supposed to cure the maladies of the finger nail. Small annual herbs, with dichotomous branches.

A. DICHO'TOMA.

Stem dichotomous; *leaves* lanceolate; those of the stem opposite, of the branches alternate; *flowers* about as long as the stipules. A very slender plant, half a foot high, much branched. At each fork are two opposite, smooth, acute leaves, and several minute, pointed stipules. Flowers axillary, solitary, very small, white. Jn.—Aug. *Fork Chick-weed.*

2. SPE'RGULA.

Sepals 5, nearly distinct; petals 5, entire; stamens 5—10; styles 3—5, capsule superior, ovate, 1-celled, 5-valved.

Lat. *spergo*, to scatter; from the dispersion of its seeds. Annual herbs, with flowers in loose cymes.

1. S. ARVE'NSIS.

Leaves whorled; *stalks* of the fruit reflexed; *seeds* reniform, angular, rough. A common weed, growing in cultivated grounds, and flowering from June to Sept. Root small. Stem round, branched, with swelling joints, beset with copious, linear, whorled leaves, somewhat downy and viscid. Two stipules under each whorl. Cyme forked, the terminal (central) peduncles bending down as the fruit ripens. Petals white, longer than the calyx, capsule twice as long. Seeds many, with a membranous margin. *Corn Spurry. Tares.*

2. S. RUBRA. *T. & G.* Arenaria rubra. *L.*

Stems decumbent, much branched; *leaves* linear, slightly mucronate; *stipules* ovate, membranous, cleft; *sepals* lanceolate, with scarious margins; *petals* red or rose-color; *seeds* compressed, angular, roughish. A common and variable species. Found in sandy fields, &c. Stems a few inches in length, slender, smooth, spreading on the ground, with small narrow leaves, and dry sheathing stipules. Flowers small, on hairy stalks. May—Oct.

Common Sand-wort.

ORDER XXIV. CARYOPHYLLACEÆ. *The Pink Tribe.*

Cal.—Sepals 4—5, distinct, or cohering in a tube, persistent.
Cor.—Petals 4—5 (sometimes none), either unguiculate, and inserted upon the pedicel of the ovary, or without claws, and inserted on the outside of a fleshy disk.
Sta.—Twice as many as the petals, rarely equal or fewer; *anthers* introrse.
Ova.—Often stipitate. Styles stigmatose the whole length of their inner surface.
Fr.—A 1-celled capsule or imperfectly 2—5-celled, opening at the apex by twice as many teeth as there are stigmas. Seeds numerous.

An order of herbs with opposite, entire leaves, no stipules, and stems swelling at the joints. They are noticeable chiefly for the beauty of a few of the cultivated species. It includes eleven North American genera. The remainder of the order is found in the temperate and frigid climates of the Eastern Continent. Their properties are unimportant.

Conspectus of the genera.

Calyx	not tubular.	Styles 3.	Petals 5, entire.	Sepals partly united.	*Honckenya.* 3
				Sepals entirely distinct.	*Arenaria.* 2
			Petals 5, bifid.		*Stellaria.* 1
			Petals 0.		*Mollugo.* 5
		Styles 4.	Petals 4—5 or 0, entire.		*Sagina.* 4
		Styles 5.	Petals 5, bifid.		*Cerastium.* 6
			Calyx calyculate with 2—4 scales at base.		*Dianthus.* 10
	tubular.	Styles 2.	Calyx without scales at the base.		*Saponaria.* 9
		Styles 3.			*Silene.* 7
		Styles 5.			*Lychnis.* 8

TRIBE 1, ALSINEÆ.

Sepals distinct or nearly so. Petals without claws inserted on the outside of the disk. Stamens inserted on the margin of the disk.

1. STELLA'RIA.

Sepals 5, connected at base; petals 5, 2-parted; stamens 10, rarely fewer; styles 3, sometimes 4; capsule superior, 1-celled, 3-valved, many-seeded.

Lat. *stella*, a star; the flowers are stellate or star-like. Small, grass-like herbs, in moist or shady places. Flowers in forked cymes.

1. S. ME'DIA.

Leaves ovate; *stems* procumbent, with an alternate, lateral, hairy line; *stamens* 3, 5 or 10. A common weed in almost every situation, flowering from the beginning of spring to the end of autumn. Stems prostrate, branched, brittle, round, jointed, leafy, and remarkably distinguished by the hairy ridge extending from joint to joint, in an alternate manner. Flowers small, white. The seeds are eaten by poultry and the birds. Ann. *Chick-weed Stich-wort.*

2. S. LONGIFO'LIA.

Leaves linear, entire; *cyme* terminal, spreading, with lanceolate, scarious bracts; *calyx* 3-nerved, about equal to the petals. The stems are of considerable length, very slender and brittle, supported on other plants and bushes. Leaves alternate at base. The flowers are in a divaricate, naked cyme, very elegant, white, appearing in 10 segments like the other species. Three acute, green ribs singularly distinguish the sepals. Jn. Jl. *Grass-leaved Stich-wort.*

3. S. BOREA'LIS. *Bw.*

Stem weak, smooth; *leaves* veinless, broad-lanceolate, acute; *peduncles* axillary, elongated, 1-flowered; *petals* 3-parted, about equal to the nerveless *sepals.* A spreading plant, with flowers in diffuse cymes, both terminal and axillary. Peduncles filiform, petals sometimes wanting. Grows in mountain bogs. Jn. Jl. *Northern Stellaria.*

4. S. LO'NGIPES. *Goldie.* S. palustris.

Smooth and shining; *leaves* linear-lanceolate, broadest at base, acute; *stem* more or less decumbent, with ascending branches; *peduncles* and *pedicels* filiform, cymose, with ovate, membranous bracts at base; *sepals* with membranous margins, obscurely 3-nerved, scarcely shorter than the petals. In meadows and moist gravelly soils. Petals white, 2-parted. Flowers in loose cymes, the terminal peduncle, or the middle one, the longest. Jn.—Aug. Per. *Long-stalked Stich-wort.*

2. ARENA'RIA.

Sepals 5, spreading; petals 5, entire; stamens 10; styles 3; capsule 3-valved, 1-celled, many-seeded.

Lat. *arena*, sand; in which most of the species grow. Flowers terminal. Sta. often less than 10.

1. A. GREENLA'NDICA. *Spreng.* A. glabra. *B.*

Glabrous; *stems* numerous, low, filiform, sub-erect; *leaves* linear-subulate, flat, spreading; *pedicels* 1-flowered, elongated, divaricate; *sepals* nerveless, ovate, obtuse, membrane-margined, much shorter than the petals. An interesting little plant, enlivening the bleak and barren summits of Mt. Washington and others of that group, where I saw it in blossom in the month of Aug. It grows in tufted masses, consisting of exceedingly numerous stems, about 3 inches high, and sprinkled over with large white flowers, with yellow stamens. Root perennial. The plant is also native of Greenland. *Greenland Sand-wort.*

2. A. STRIA'TA.

Glabrous; *stem* diffusely spreading, branched from the base; *leaves* subulate-linear, erect; *petals* much longer than calyx; *sepals* oval-lanceolate,

striate; *cymes* few-flowered. Stems 8—10 inches high, with erect, very narrow leaves, clustered in dense tufts in each axil, generally shorter than the internodes. May. Jn. Per. *Straight Sand-wort.*

3. A. LATERIFLO'RA.

Leaves oval, obtuse; *peduncles* lateral, 2-flowered. An erect, slender species, 6—10 inches high, slightly pubescent, found in damp, shady grounds. Leaves oblong-oval, opposite, on very short petioles. Peduncles axillary, dividing into 2 or more pedicels, one of them with a minute pair of bracts near the middle and a white flower. Calyx leaves oval, united at base, obtuse, nerveless, shorter than the corolla. Jn. Per. *Side-flowering Sand wort.*

4. A. SERPYLLIFO'LIA.

Stem dichotomous, spreading; *leaves* ovate, acute, subciliate; *calyx* acute, sub-striate; *petals* shorter than the calyx; *capsule* ovate, 6-toothed. By road sides and in sandy fields. Stems numerous, downy with reflexed hairs, a few inches in length, with sessile, acute leaves and axillary, white flowers. Jn. Ann. *Thyme-leaved Sand-wort.*

3. HONCKE'NYA.

Sepals 5, united at base; petals 5, unguiculate, entire; stamens 10, inserted into a glandular disk; styles 3—5; capsule 3—5-valved, 1-celled, many-seeded.

Perennial herbs of the sea-coast, with fleshy leaves.

H. PEPLOI'DES. *Dc.* Arenaria peploides. *L.*

Leaves ovate, acute, fleshy; *sepals* obtuse, ribless, exceeding the petals. Abundant on the sea-coast and other sandy soils. The plant is smooth, fleshy in all its parts, near a foot in length, with forked branches. Flower small, white, axillary. Jl. *Sea Chickweed.*

4. SAGI'NA.

Sepals 4—5, united at base; petals entire, 4, 5 or 0; stamens 4—10; styles 4—5; capsules 4—5-valved, many-seeded.

Lat. *sagina*, any kind of food or nourishment; from the nourishing qualities of some of the species. Flowers solitary.

1. S. PROCU'MBENS.

Stems procumbent, glabrous; *petals* very short; *stamens*, *sepals* and *petals* 4 or 5. A small weed with slender, creeping stems 3 or 4 inches long, found in dry pastures and by road-sides. Leaves very small, linear, mucronate-pointed, connate or opposite. Flowers white and green, axillary and terminal, on peduncles larger than the leaves. Jn. Per. *Creeping Pearlwort.*

2. S. DECU'MBENS. *T. & G.* Spergula saginoides. *L.*

Stems decumbent, ascending, mostly glabrous; *leaves* linear-subulate, very acute; *peduncles* much longer than the leaves; *petals* and *sepals* 5; *stamens* 10. Grows in sandy fields, flowering in July. Stem 2 or 3 inches long. Flowers axillary and terminal. Petals white, hardly as large as the sepals. Ann. Apparently a variety of S. procumbens. *Decumbent Pearlwort.*

5. MOLLU'GO.

Calyx of 5 sepals, inferior, united at the base; corolla 0; capsule 3-celled, 3-valved, many-seeded. Stamens 5, sometimes 3 or 10.

The old Lat. name of a plant which this somewhat resembles. The interior of the sepals colored. Fil. setaceous, shorter than, and opposite to the sepals, placed very near the pistils. Anth. simple. Seeds reniform.

M. VERTICILLA'TA.

Leaves verticillate, cuneiform, acute; *stem* depressed, branched; *peduncles* 1-flowered. A small prostrate plant, common in cultivated grounds. Stems slender, jointed, branched, lying flat upon the ground. At every joint stands a whorl of wedge-shaped or spathulate leaves of unequal size, usually 5 in number, and a few flowers, each on a solitary stalk, which is very slender, and shorter than the petioles. Flowers small, white. Jl.—Sept. Ann.
Carpet-weed.

6. CERA'STIUM.

Calyx of 5 sepals; petals 5, bifid; stamens 10; capsule 1-celled, superior, 10-toothed; seeds numerous.

Gr. κέρας, a horn; from the horned appearance of the capsules of many of the species. Sep. ovate, acute, permanent. Pet. length of Sep. Fil. generally 10, sometimes 5 or 4, the alternate ones shorter. Anth. 2-lobed. Stig. downy.

1. C. VULGA'TUM. (*Broad-leaved.*)

Hairy, pale green, viscid, cæspitose; *leaves* ovate, alternate at base; *petals* the length of the calyx; *flowers* longer than their pedicels when young. Stems numerous, spreading, forked, 4—6 inches long. Leaves ovate or obovate. Capsule twice as long as the calyx, cylindric. Flowers from the forks of the stems, the lowest always the oldest, forming diffuse cymes. Common in fields and waste grounds, flowering all summer. Ann. *Mouse-ear Chickweed.*

2. C. VISCO'SUM. *L.* (*Narrow-leaved.*) β. semidecandum. *L.*

Hairy, viscid, spreading; *leaves* oblong-lanceolate, shorter than their stalks; *flowers* in loose cymes. Stems numerous, 4—8 inches long. The whole plant dark green, hairy and clammy. Petals obovate, white. Fields and waste grounds. Common. Jn.—Aug. *Sticky Chickweed.*

3. C. ARVE'NSE.

Leaves sub-acute, linear-lanceolate, ciliate at base; *petals* twice as long as the calyx; *capsule* scarcely exceeding the calyx. Stems numerous, about a foot high, covered with fine, deflected hairs. Leaves hairy. Flowers few, large, white, appearing all summer. Grows in dry fields. Per.

4. C. OBLONGIFO'LIUM. *Torr.* C. villosum. *Mh.*

Stems villous, erect or declined; *leaves* mostly obtuse, oblong-lanceolate; *flowers* numerous, with viscid peduncles; *petals* twice as long as the sepals; *capsule* as long as the petals. Flowers in forked cymes, rather large, white. Grows in rocky places. Stem 6—10 inches high, thick. Apr.—Jn. Per.
Hairy Chickweed.

Tribe 2, SILENEÆ.

Sepals united into a cylindrical tube. Petals clawed, inserted with the stamens upon the stipe of the ovary.

7. SILE'NE.

Calyx tubular, swelling, without scales at the base, 5-toothed; petals 5, unguiculate, often crowned with scales at the mouth, 2-cleft; stamens 10; styles 3; capsule 3-celled, many-seeded.

Named after the god Silenus of the Latins, whom their poets represent as always drunk, and covered with slaver, as the species of this genus usually are with a viscid secretion. Five alternate stamens are attached to the petals, and later than the rest.

1. S. Pennsylva'nica.

Viscid-pubescent; *stems* numerous; *leaves* from the root spathulate or cuneate, of the stem lanceolate; *cyme* few-flowered; *petals* slightly emarginate, sub-crenate. Grows in dry, sandy soils. Stem decumbent at base, nearly a foot high, with long, lanceolate leaves, and terminal, upright bunches of flowers. Calyx long, tubular, very glutinous and hairy. Petals wedge-shaped, red or purplish. Jn. Per. *Catch-fly. Wild Pink.*

2. S. Antirrhi'na.

Nearly smooth; *stem* erect; *leaves* lanceolate, acute, sub-ciliate; *peduncles* trifid, 3-flowered; *petals* emarginate; *calyx* ovate. Stem slender, branching, with opposite leaves and about a foot in height. Leaves about 2 inches long, the upper ones very narrow, all sessile, and scabrous on the margin. A few of the upper internodes are viscidly pubescent above their middle. Flowers small, red, in loose, erect cymes. Road sides and dry soils. Jl. Per. *Snap-dragon Catch-fly.*

3. S. Virgi'nica.

Viscid-pubescent; *stem* procumbent or erect, branching; *flowers* large, cymose; *calyx* large, clavate; *petals* bifid, broad, crowned. From 12 to 18 inches high. Leaves oblong, a little rough at the margin. Cymes dichotomous. Stamens and pistils exsert. Petals red, large. Jn. Per. *Virginian Catch-fly.*

4. S. noctiflo'ra.

Viscid-pubescent; *stem* erect, branching; lower *leaves* spathulate, upper leaves linear; *calyx* cylindrical, ventricose, the alternate striæ vined; *teeth* subulate, very long; *petals* 2-parted. From Europe, introduced into our cultivated grounds. Flowers rather large, white, expanding only in the evening and in cloudy weather. *Night-flowering Catch-fly.*

5. S. stella'ta. *Ait.* Cucubalus stellatus. *L.*

Erect, pubescent; *leaves* in whorls of 4s, oval-lanceolate, acuminate. Stem 2—3 feet high, with paniculate cymes of white flowers. At each of the distant, tumid nodes, is a whorl of sessile, spreading, long-pointed leaves. Petals wanting the crown of scales. Calyx not reticulated, the segments tapering to a mucronate point. Woods. Jl. Per. *Star-like Campion.*

6. S. INFLA'TA. *Sm.* Cucubalus Behen. *L.*

Calyx nearly globular, smooth, reticulated with veins; *leaves* ovate-lanceolate, glaucous, smooth; *flowers* in cymose panicles, drooping. Stem erect, about 2 feet high. Petals white, cleft half way down. The calyx remarkably inflated, and finely reticulated with pale purple veins. In pastures, about fences, &c. The young shoots and leaves when boiled, may be used as a substitute for asparagus or peas, which they resemble in taste. Jl. Per. *Bladder Campion.*

7. S. ARME'RIA.

Very smooth, glaucous, viscid; *leaves* ovate-lanceolate; *flowers* in paniculate cymes; *petals* obcordate, crowned. Native of Europe. Introduced. A popular garden flower. Stem a foot and a half high, with numerous pink-colored flowers. Jl.—Sept. Ann. *Garden Catch-fly.*

8. S. VISCO'SA.

Pubescent, very viscid; *stem* simple, thick, leafy; *leaves* large, linear-lanceolate, wavy; *flower* large, nodding; *petals* red. Native of Levant. Cultivated in gardens. About 2 feet high. Bien. *Clammy Catch-fly.*

8. LYCHNIS.

Calyx tubular, 5-tooth, oblong; petals 5, clawed; limb slightly cleft; stamens 10; pistils 5; capsule 1—5-cleft, with a 5-toothed opening.

Gr. λυχνος, a lamp; because the cottony leaves of some species have been used as wicks to lamps. Cal. inferior, membranous. Pet. claws length of cal., sometimes crowned. Fil. longer than cal., fixed to the claws.

1. L. GI'THAGO. *Lam.* Agrostemma Githago. *L.*

Hairy; *stem* dichotomous; *flowers* on long stalks; *leaves* linear; *calyx* much longer than the corolla; *petals* entire, without a crown. A well known, handsome weed, growing in corn-fields, or wheat-fields, of a pale green color, with large, pink-like and very ornamental flowers. Corolla of a dull purple. Introduced from Europe. Jl. *Corn Cockle.*

2. L. CHALCEDO'NICA.

Smoothish; *flowers* fascicled; *calyx* cylindric, clavate, ribbed; *petals* two-lobed. A fine garden flower, native of Europe. Stem 2 feet high, with pointed, opposite, dark green leaves, and a large, terminal, convex, dense fascicle of flowers, remarkable for their deep scarlet hue Jn. Jl. *Scarlet Lychnis.*

β. Flowers white.

γ. Flowers double. This is chiefly valued in cultivation.

3. L. FLOSCU'CULI.

Smoothish; *stems* ascending; *flowers* dichotomous, fascicled; *calyx* campanulate, 10-ribbed. Petals in 4 deep, linear segments. Leaves lanceolate, smooth. Fruit roundish, 1-celled. Stem 1—2 feet high, with rough angles, viscid above. Flowers pink, very delicate, with a brown, angular, smooth calyx. Native in Britain. Jl.—Sept. *Ragged Robin.*

4. L. CORONA'RIA.

Smooth; *flowers* terminal and axillary, 1—3; *calyx* rounded, clavate, ribbed; *petals* torn. Native of China. Remarkable for the large size of the flowers. Stem 1—2 feet high. Petals of a lively red. *Chinese Lychnis.*

9. SAPONA'RIA.

Calyx tubular, naked; petals 5, clawed; stamens 10; styles 2; capsule oblong, 1-celled.

Lat. *sapo*, soap; the mucillaginous juice is said to make soap. Cal. inferior, 5-toothed. Claws long as cal. Limb dilated toward the end. Fil. long as cal. and styles. Stig. acute, downy. Caps. concealed in the calyx.

S. OFFICINA'LIS.

Calyx cylindrical; *leaves* lanceolate, inclining to elliptical. A hardy, smooth and suculent plant, with handsome flowers resembling the pink, (Dianthus.) Stems 1 or 2 feet high, with opposite leaves, and a terminal panicle of erect, flesh-colored flowers. The taste is bitter, and the juice in water will raise a lather like soap, and will take out spots of grease. Road-sides. Jl. Aug. Per. Introduced and naturalized. Flowers frequently double.

Common Soap-wort.

10. DIA'NTHUS.

Calyx cylindrical, tubular, with scales at base; petals 5, with long claws; stamens 10; styles 2; capsule cylindric, 1-celled.

Gr. Διος ανθος, Jupiter's flower, or the divine flower; so named on account of its preëminent beauty and fragrance. Cal. inferior, striate, 5-toothed, with 2 or more pairs of opposite, imbricate scales at base. Claws as long as cal. Limb flat, dilated outwards, unequally notched. Fil. as long as calyx. Ova. oval. Sty. longer than stam., with revolute, tapering stig.

1. D. ARME'RIA.

Flowers aggregate, fascicled; *scales* of the calyx villose, lanceolate, as long as the tube. Our only native species of the pink. In fields and pine woods. Stem a foot high, leafy, pubescent, corymbose above. Leaves opposite, pubescent, linear-lanceolate, the lower ones broader, clasping at base. Flowers terminal, small, without fragrance. Petals pink, sprinkled with white, crenate on the margin. Aug. Ann. *Wild Pink.*

2. D. BARBA'TUS.

Flowers aggregate, fascicled; *scales* ovate, subulate, as long as the tube; *leaves* lanceolate. Long known and valued as an ornamental flower, and is still esteemed, as in the times of old Gerarde, "for its beauty to deck up the bosoms of the beautiful, and garlands and crowns for pleasure." It has many varieties. Flowers in Jn., Jl. Per. *Sweet William.*

3. D. CHINE'NSIS.

Stem branched; *flower* solitary; *scales* linear, leafy, spreading, as long as the tube; *leaves* linear-lanceolate. An elegant species, well characterized by its leafy, spreading scales, and its large, toothed or crenate, red petals. The foliage, like the other species, is evergreen, being as abundant and vivid in winter as in summer. Native of China. Jl.—Sept. Bien. *China Pink.*

4. D. PLUMA'RIUS.

Glaucous; *stems* 2—3-flowered; *flowers* solitary; *teeth* blunt; *bracts* ovate, very pointed; *leaves* linear, rough at the edge; *corolla* many-cleft, throat

hairy. Native of Europe. From this species probably originated those beautiful pinks called pheasants' eyes, of which there are enumerated in Scotland, no less than 300 varieties. Flowers white and purple. Jn.—Aug. Per.
Single Pink. Pheasants'-eyes.

5. D. CARYOPHY'LLUS.

Flowers solitary; *scales* very short, ovate; *petals* very broad, beardless; *leaves* linear-subulate, channeled, glaucous. Stem 2—3 feet high, branched. Flowers white and crimson; petals crenate. This species is supposed to be the parent of all the varieties of the splendid Carnation. Over 400 sorts are now enumerated by florists, distinguished mostly by some peculiarity in colors, which are crimson, white, red, purple, scarlet, yellow, and arranged in every possible order of stripes, dots, flakes, angles, &c. Carnations are propagated by layers, cuttings and seeds. They thrive best in rich loam, rather sandy, and should be protected from all extremes of heat or cold, dryness or moisture. *Carnation Pink.*

6. D. SUPE'RBUS.

Flowers fastigiate; *scales* short, ovate, mucronate; *petals* pinnate. A singularly beautiful pink, native of Europe. Stem 2 feet high, paniculate, branching, with many flowers. Petals white, gashed in a pinnate manner beyond the middle, and hairy at the mouth of the tube. Jl.—Sept. Per. *Superb Pink.*

The species of this admirable genus are quite numerous, exceeding a hundred, nearly all of them valued as well for their fragrance as their beauty, displaying the gentler attributes of their Creator.

ORDER XXV. PORTULACACEÆ. *The Purslane Tribe.*

Cal.—Sepals 2, united at the base.
Cor.—Petals 5, sometimes more or less, imbricated in æstivation.
Sta.—Variable in number. *Filaments* distinct. *Anthers* versatile or introrse.
Ova.—Superior, 1-celled. *Styles* several, stigmatose along the inner surface.
Fr.—A pyxis, dehiscing by a lid, or capsule, loculicidal, with as many valves as stigmas

A small order of succulent plants, inhabiting dry places in every quarter of the world. They possess no remarkable properties.

Genera.

Stamens 8—20, ... *Portulaca.* 1
Stamens 5, ... *Claytonia.* 2

1. PORTULA'CA.

Sepals 2, the upper portions deciduous; petals 5, equal; style 3—6-cleft; pyxis subglobose, dehiscing near the middle, many-seeded.

An ancient name, of unknown origin. Low, herbaceous weeds. Flowers expanding only in sunshine.

P. OLERA'CEA.

Leaves cuneate; *flowers* sessile. A prostrate, fleshy weed, more common in our gardens than seems desirable. Stem thick and succulent, much branched and spreading, smooth. Leaves fleshy, sessile, rounded at the end. Flowers yellow. The herbage of the plant is of a reddish green color. Sometimes used as a *pot-herb.* Jn.—Aug. Ann. *Purslane.*

2. CLAYTO'NIA.

Calyx of 2 sepals; corolla of 5, emarginate, obcordate petals; stamens 5, inserted on the claws of the petals; stigma 3-cleft; capsule 3-valved, 2—5-seeded.

In memory of John Clayton, a botanist of Virginia. Small, fleshy, delicate, early-flowering plants.

1. C. CAROLINIA'NA.

Leaves ovate-lanceolate; *sepals* and *petals* obtuse; *root* tuberous. A pretty little plant, flowering in April, common among the rocky hills of N. England. Root a compressed, brown tubercle, buried at a depth in the ground equal to the height of the plant. Root-leaves very few if any, spathulate. Stem weak, 2—3 inches high, with a pair of opposite leaves half-way up, which are oblong-ovate, entire, obtuse, tapering at base into the petiole. Flowers in a terminal cluster, white, with a slight tinge of red, and beautifully penciled with purple lines. Apr. May. Per. *Spring beauty.*

2. C. VIRGI'NICA.

Leaves linear-lanceolate; *petals* obovate, mostly emarginate or retuse; *sepals* rather acute; *pedicels* slender, nodding. Habits similar to the last, but less common in the Northern States. Tubercle or cormus as large as a hazel-nut, deep in the ground. Stem a few inches high, weak, with a pair of opposite, very narrow leaves. Flowers 5—10, rose-colored, with deeper colored veins, in a terminal raceme. Apr. May. Per. *Virginian Spring Beauty.*

ORDER XXVI. ELATINACEÆ. *The Water-pepper Tribe.*

Cal.—Sepals 2—5, distinct or slightly coherent at the base, persistent.
Cor.—Petals hypogynous, as many as the sepals.
Sta.—Equal in number to, or twice as many as the petals. *Anthers* introrse.
Ova.—2—5-celled. *Styles* 2—5. *Stigmas* capitate; placentæ in the axis.
Fr.—Capsular. *Seeds* numerous.

A very small order of annual marsh plants, found in every part of the globe, and having no known peculiar properties. The only known Northern genus is the Elatine of Linnæus, the Crypta of Nuttall or the Peplis of Pursh.

ELA'TINE.

Stigmas sessile, minute.

Gr ελατη, fir; the fine, slender leaves of some of the species have been compared to those of the fir-tree.

E. AMERICA'NA. *L.* Cypta minima. *N.* Peplys Americana. *P.*

Stem diffuse, procumbent, striate, rooting from the joints, with assurgent branches; *leaves* cuneate-oval or obovate, obtuse, entire; *styles* 0; *sepals*, *petals*, *stamens* and *stigmas* 2 or 3, as well as the *cells* and *valves* of the capsule; *stipules* very minute. A small mud plant, on the borders of ponds and rivers. Flowers axillary, sessile, solitary. Corolla minute, closed. Jl.—Sept. *Mud Purslane.*

ORDER XXVII. LINACEÆ. *The Flax Tribe.*

Cal.—Sepals 3, 4 or 5, distinct, or more or less united; æstivation strongly imbricated.
Cor.—Petals equal in number to sepals, hypogynous, unguiculate; æstivation twisted.
Sta.—3, 4 or 5, united at base into a hypogynous ring, which is often toothed, opposite the pet.
Ova.—Of as many cells as sepals or styles. Stigma capitate.
Sds.—Solitary in each cell, compressed.

An order containing only a very few herbaceous plants or small shrubs, yet a very important one in the arts. The Linum has a very tenacious fibre in its bark, which is wrought into thread and cloth, forming the *linen* of commerce. Some species are cathartic, and yield from their seeds a fine mucilage. Only one genus need be mentioned here, viz:

LINUM.

Sepals, petals and stamens 5; styles 5, rarely 3; capsule 5-celled, cells nearly divided by a false dissepiment.

Gr. λινον, flax, which is from *llin* in Celtic, signifying a thread.

1. L. VIRGINIA'NUM.

Calyx leaves acute; *panicles* corymbose, terminal; *flowers* remote, alternate; *leaves* alternate, oblong-lanceolate, those of the root ovate. Woods, &c. Stem slender, leafy, 1—3 feet high, ascending, bearing at top a thin panicle of small, yellow flowers on short pedicels. Jl. Ann. *Virginian or Wild Flax.*

2. L. USITATI'SSIMUM.

Calyx leaves ovate, acute, 3-nerved; *petals* crenate; *leaves* lanceolate, alternate; *stem* nearly solitary. This important plant has been cultivated from the earliest antiquity, for the fibres of its bark, which when separated from its woody stalk by the *brake*, and cleared from the *tow* by the *hatchel*, is spun into thread and woven into linen cloth. So ancient is the manufacture of linen, that it appears to have been carried to great perfection in Egypt, in the times of the Pharaohs, (Gen. 41: 42;) and mummies are there found at this day, enveloped in linen fabrics of great fineness and beauty, which can be no less than 3000 years old. The seeds yield the *linseed oil*, so extensively used in mixing paint, printer's ink, &c. Native country unknown; perhaps it is indigenous to many. Stem 1 or 2 feet high, branching above, with 3-nerved leaves, and bearing at top many handsome blue flowers. Jn. Jl. Ann. *Flax.*

ORDER XXVIII. GERANIACEÆ. *The Geranium Tribe.*

Cal.—Sepals 5, persistent, ribbed, one sometimes saccate or spurred at base.
Cor.—Petals 5, hypogynous or perigynous, unguiculate; æstivation twisted.
Sta.—Usually monadelphous, hypogynous, twice or thrice as many as the petals.
Ova.— } Of 3 united carpels, 2 ovuled, alternate with sepals, upon an elongated axis, from
Fr.— } which they separate in fruit, curving upwards on the persistent style.

A small order of herbaceous plants or shrubs, with tumid and separable joints. The Cape of Good Hope is the favorite habitation of some of the most important genera. Most species of the beautiful Pelargonia are native of that region alone.

Conspectus of the Genera.

Stamens 10,	all perfect,	*Geranium.*	1
	5 perfect, with 5 shorter and imperfect,	*Erodium.*	2
	7 perfect; corolla irregular,	*Pelargonium.*	3

1. GERA'NIUM.

Sepals and petals 5, regular; glands 5, nectariferous, united to the base of the longer stamens; stamens 10, all perfect;

fruit rostrate, at length separating into 5, long-styled, 1-seeded carpels; styles smooth inside.

Gr. γερανος, a crane; the capsule and beak resembling the head of that bird. Styles erect, longer than the stamens, permanent. Stig. 5, oblong, reflexed. Carpels 5, aggregate, globose, each tipped with the long, linear, erect pointed, rigid style, smooth, naked, at length recurved and adhering by its point to the summit of the axis. This is the original genus of Linnaeus, formerly including all those ornamental species popularly called Geraniums, since divided by L'Heritier into the three genera, Erodium, Pelargonium and Geranium.

1. G. MACULA'TUM.

Leaves 3—5-parted, cut, radical ones on very long stalks; *peduncles* 2-flowered; *stem* somewhat angular, dichotomous, erect, retorsely pubescent. This species is very common in moist woods, about streams, &c., and is not inferior in beauty to many that are cultivated in the parlor and green-house. Stem 1 or 2 feet high. Leaves large, hairy, deeply lobed and variously cut, upper ones nearly sessile. Flowers large, purple, 2 together on a long, hairy peduncle. The leaves in late summer and autumn are said to become marked with pallid spots, as the name indicates. Root astringent, medicinal, perennial. May, June. *Spotted Geranium.*

2. G. ROBERTIA'NUM.

Leaves 3—5-parted, the segments pinnatifidly 3-cleft; *peduncles* 2-flowered; *calyx* 10-angled, awned, much shorter than the entire petals. A smaller and less interesting plant than the preceding, but no less common. Found in dry, rocky places. It has a reddish stem, with long, diffuse, weak branches. Leaves stalked, somewhat hairy, ternate or quinate, with pinnatifid leaflets. Flowers small, pale purple. Capsules small, rugose, keeled. Seeds smooth. The plant has a strong, disagreeable smell. Flowers from May to Sept. Per. *Herb Robert. Stinking Cranes'-bill.*

3. G. PUSI'LLUM.

Leaves 5-parted, the lobes 3-cleft, linear; *peduncles* 2-flowered, long; *petals* emarginate, as long as the awned calyx. A delicate annual species, growing in waste grounds, pastures, &c. Stem weak, a foot high, branching, covered with short deflected hairs. Leaves opposite, divided almost to the base into 5 or 7 lobes, these again variously cut. Peduncles axillary, forked, bearing 2 purplish red flowers in Jn. and Jl.

4. G. CAROLINIA'NUM.

Leaves 5-lobed, lobes trifid, cut; *peduncles* 2-flowered, clustered at the end of the branches; *petals* emarginate, as long as the awned calyx. A diffuse, pubescent plant, 8—15 inches high. Leaves on long stalks, beautifully and deeply divided, and of a 5-sided figure. Flowers rose-colored. Jl. Bien. *Carolinian Geranium.*

5. G. SANGUI'NEUM.

Stem erect, diffuse, branched; *peduncle* longer than petioles; *leaves* opposite, 5-parted, lobes trifid, with linear segments. A beautiful species, native of Europe, deemed worthy of culture by many a florist. Grows about a foot high. Leaves orbicular, deeply divided into 5 or 7, 3-fid lobes. Flowers large, round, of a deep red or blood color. *Bloody Geranium.*

6. G. ANEMO'NIFO'LIUM.

Stem shrubby; *leaves* smooth, palmate, 5-cut, the seg. bipinnatifid; *peduncles* opposite, erect, hairy, 2-flowered. An extremely beautiful species, from the Cape. Stem 3 feet high, with large, fern-like leaves of the most delicate, glossy green. Flowers large, red. *Anemone-leaved Geranium.*

2. ERO'DIUM.

Calyx 5-leaved; petals 5; scales 5, alternate with the filaments and nectariferous glands at the base of the stamens; filaments 10, the 5 alternate ones abortive; fruit rostrate, of 5 aggregate capsules, each tipped with the long spiral style, bearded inside.

Gr. ερωδιος, a heron, because the fruit resembles the beak of that bird.

1. E. CICUTA'RIUM.

Stem prostrate or diffuse, hairy; *leaves* pinnate, with cut-pinnatifid segments; *peduncles* double, many-flowered; *petals* unequal. A small species in waste places, with prostrate or diffuse branches, and many finely divided leaves, which somewhat resemble those of the cicuta or poison hemlock. Flowers small, purple, irregular. The whole plant is fetid. Apr. Ann. *Hemlock Geranium.*

β. bipinnatum has a caulescent stem, diffuse branches, segments of leaves pinnatifid, with linear lobes.

2. E. MOSCHA'TUM.

Stem procumbent; *leaves* pinnated with stalked, ovate, unequally serrated segments; *peduncles* downy, glandular; *petals* equalling the calyx. Native of England. Sometimes cultivated for the strong musky scent of its herbage. A foot high. Leaves large, flowers small, purple. May—Jl. Ann. *Musk Geranium.*

3. PELARGO'NIUM.

Calyx of 5 sepals, the upper one ending in a nectariferous tube, extending down the peduncle with which it is connected; petals 5, irregular, longer than the sepals; filaments 10, 3 of them barren.

Gr. πελαργος, a stork, in allusion to the beak of the fruit, which resembles the bill of that bird, as well as to preserve an analogy with Geranium, (Crane's-bill) from which genus this was taken. An immense genus from the Cape of Good Hope, embracing more than 200 species and several hundred varieties, with endless differences of form, size and color. No genus seems to be regarded with such universal favor for green-house plants as this. The species are cultivated with assiduous attention, by nearly every family, which makes the least pretensions to taste, throughout the civilized world.

* Stem very short. Root tuberous.

1. P. FLAVUM.

Leaves decompound, lasciniate, hairy; *segments* linear; *umbel* many-flowered; *stem* very simple. Flowers brownish yellow. From the Cape of Good Hope, as well as all the other species. *Carrot-leaved Geranium.*

2. P. TRISTI.

Leaves hairy, pinnate; *leaflets* bipinnatifid; divisions linear, acute. A foot high. Flowers dark green, in simple umbels. *Mourning Geranium.*

** Stem elongated, herbaceous or suffruticose.

3. P. ODORATI'SSIMUM.

Leaves roundish, cordate, very soft; *stem* short, fleshy; *branches* herbaceous, long-diffuse. Chiefly valued for the powerful, aromatic smell of the leaves, the flowers being small, whitish. *Nutmeg-scented Geranium.*

4. P. ALCHEMILLOI'DES.

Stem villous; *leaves* cordate, villous, 5-lobed, palmate; *peduncles* few-flowered; *stigma* sessile. Stem 6 inches high, diffuse, very hairy, with deflexed bristles. Flowers pink-colored. *Lady's-mantle Geranium.*

5. P. TRI'COLOR.

Stem suffruticose, erect; *leaves* lanceolate, villous, cut-dentate, trifid; *upper petals* glandular at base. Stem 1½ feet high. This species is distinguished for its beautifully variegated flowers. Petals roundish and nearly uniform in shape, but very different in color. The 3 lower ones are white, slightly veined; the 2 upper, of a rich purple, almost black at base. *Three-colored Geranium.*

6. CORIANDRIFO'LIUM.

Stem herbaceous, biennial, somewhat downy; *leaves* bipinnate, smooth; *lobes* linear, subpinnatifid. Stem diffuse, a foot high. Distinguished by the finely divided leaves and large flowers. The 2 upper petals much the largest, obovate, veined with purple; the 3 lower, of which the middle one is often wanting, are narrow and of a pure white. *Coriander-leaved Geranium.*

*** Leaves neither divided nor angular; stem fruticose.

7. P. GLAUCUM.

Very smooth and glaucous; *leaves* lanceolate, entire, acuminate; *peduncles* 1 or 2-flowered. Stem 3 feet high, shrubby and branched. The plant is remarkably distinguished by its leaves. Peduncles axillary, with 1 or 2 elegant flowers. Petals obovate, of a delicate blush-color, with red veins. *Glaucous-leaved Geranium.*

8. P. BETULI'NUM.

Leaves ovate, unequally serrate, smoothish; *stipules* ovate-lanceolate; *peduncles* 2—4-flowered. Stem shrubby, 3 feet high. The plant is well named for its leaves. Flowers pale pink, with deep-red veins. *Birch-leaved Geranium.*

9. P. ACETO'SUM.

Leaves very smooth, obovate, crenate, somewhat fleshy; *peduncles* few-flowered; *petals* linear. Stem shrubby, 3 feet high. Named for the acid flavor of the leaves. Flowers pink. *Sorrel-leaved Geranium.*

**** Leaves either angular, lobed or palmate; stem fruticose.

10. P. ZONA'LE.

Leaves cordate-orbicular, obsoletely lobed, toothed, marked with a concentric zone. Stem thick, shrubby, 2 or 3 feet high. One of the most popular

of all the species. Leaves always marked with a dark concentric stripe of various shades. The flowers are of a bright scarlet, umbelled, on long peduncles. It has many varieties, of which the most remarkable is

β. *marginale*, silver-edged, the leaves of which are bordered with white.
Horse-shoe Geranium.

11. P. I'NQUINANS.

Leaves round, reniform, scarcely divided, crenate, viscid; *umbels* many-flowered; *petals* obovate, cuneate. Justly admired for the vivid scarlet of its numerous flowers. The name alludes to the reddish, clammy moisture which stains the fingers in handling the soft downy branches. *Scarlet Geranium.*

12. P. PELTA'TUM.

Leaves 5-lobed, entire, fleshy, smooth, more or less peltate; *umbels* few-flowered. Stem climbing, several feet in length. Whole plant very smooth. A beautiful species with umbels of very handsome purplish flowers.
Ivy-leaved Geranium.

13. P. TETRAGO'NUM.

Branches 4-cornered, fleshy; *leaves* cordate, bluntly lobed, somewhat toothed. Petals 4; the 2 upper ones pale pink, with crimson veins; the 2 lower, small, white. Leaves small, rounded, notched, with scattered hairs.
Square-stalked Geranium.

14. P. GRANDIFLO'RUM.

Smooth, glaucous; *leaves* 5-lobed, palmated, cordate at base, the lobes dentate towards the end; *petals* three times as long as calyx. Distinguished for the size and beauty of the flowers, which are white, the 2 upper ones elegantly veined and tinged with red, larger than the rest. *Large-flowered Geranium.*

15. P. GRAVE'OLENS.

Leaves palmately 7-lobed; *lobes* oblong, bluntly toothed, revolute and very rough at the edge; *umbels* many-flowered, capitate. Nectary about half as long as calyx. Leaves very fragrant. Flower purple. *Rose-scented Geranium.*

16. P. RA'DULA.

Leaves palmate, rough; *lobes* narrow, pinnatifid, revolute at edge, with linear segments. Umbels few-flowered. Nectary nearly as long as calyx. Flower purple. Distinguished for its large, rough leaves, deeply divided into linear segments, and with a rich, mint-like fragrance. *Rasp-leaved Geranium.*

17. P. QUERCIFO'LIUM.

Leaves cordate, pinnatifid, with rounded recesses; *lobes* obtusely crenate; *branches* and petioles hispid. Leaves rough, often spotted. Flowers purplish.
Oak-leaved Geranium.

The above are among the more distinct and popular species of this vast and favorite genus. Innumerable varieties, produced from seeds and propagated by cuttings, are equally common in collections, and often of superior beauty. Many splendid works on this order have been published, among which the "Geraniaceæ' of Mr. Sweet is the most extensive, in which "are figured and described, not only all the known species, but the multitudes of hybrid creations produced by the assistance of modern ingenuity."

ORDER XXIX. BALSAMINACEÆ. *The Balsam Tribe.*

Fls.—Very irregular.
Cal.—Sepals 5, deciduous, the 2 upper connate, the lowest spurred or gibbous.
Cor.—Petals 4, hypogynous, united by pairs, or rarely 5, distinct.
Sta.—5, hypogynous. *Filaments* subulate. *Anthers* 2-celled.
Ova.—5-celled, compound. *Stigmas* sessile. [straight.
Fr.—Capsular, 5-celled, bursting elastically by 5 valves. *Sds.* several in each cell. *Embr.*

Annual herbs with succulent stems and simple leaves. This order embraces but few genera, of which one only is represented in the U. States. With regard to its properties and uses it is of no importance. Some of its species are highly ornamental.

1. IMPA'TIENS.

Sepals apparently but 4, the 2 upper being united; petals apparently 2, each of the lower being united to each of the lateral ones; anthers cohering at the apex; capsule often 1-celled by the obliteration of the dissepiments, 5-valved, bursting elastically.

A *Lat.* term applied to these plants on account of the capsules, which, when ripe, burst at the slightest touch.

1. I. PA'LIDA.

Peduncles solitary, 2—4-flowered; *lower sepal* obtusely conical, dilated, shorter than the petals; *spur* recurved, very short; *flowers* sparingly punctate; *leaves* rhomb-ovate, mucronote-toothed; *seeds* elliptical. A curious annual plant, found about wet, shady places. Stem 2 feet high, succulent and brittle, with alternate leaves. Flowers yellow, on branching, axillary stalks, resembling ear-drops in form, whence the plant is often called Jewel-weed. The capsules when mature, burst at the slightest touch and scatter the seed; whence its more common English name, Touch-me-not, and the French, *Ne-me-touchez-pas.* Aug. *Touch-me-not.*

2. I. FULVA.

Peduncles solitary, 2—4-flowered; *lower sepal* acutely conic, longer than the petals; *spur* resupinate, emarginate, nearly as long as the upper sepals (galea); *flowers* with crowded spots; *leaves* rhomb-ovate, obtuse, mucronate-toothed; *seeds* prismatic. Common in wet, shady places. Nearly resembles the foregoing in habit, aspect, and in the irritability of the capsules. Stem covered with a glaucous powder, succulent, diaphanous, swelling at the joints. Flowers yellow, spotted with red within. Hight 2—3 feet. Aug. Ann. *Jewel-weed.*

3. I. BALSAMI'NA.

Flower stalks clustered; *leaves* lanceolate, the upper ones alternate; *spur* shorter than the flower. From the E. Indies. It is one of the most beautiful of garden annuals, forming a showy pyramid of finely variegated carnation-like flowers. The prevailing colors of the petals are red and white, but the former varies in every possible shade of crimson, scarlet, purple, pink and flesh-color. The flowers are often double. *Garden Balsamine.*

SUBORDER, TROPÆOLACEÆ.

Flowers irregular. Calyx of 5, colored, united sepals, the lowest one spurred; corolla of 5 petals, the 3 lower ones stalked; stamens 8, distinct, unequal; ovary of 3 united carpels; style 1; stigmas 3; fruit indehiscent, separating into 3 1-seeded nuts; seeds large, without albumen.

Trailing or twining herbs, with a pungent, watery juice.

2. TROPÆ'OLUM.

Characters essentially the same as of the suborder.

Lat. *tropæum*, a trophy; because the leaf resembles a shield, and the flower a helmet stained with blood, both ancient weapons of war, of which trophies were formed. Well known annual, trailing plants, both ornamental and culinary. Their properties are antiscorbutic, &c.

T. MAJUS.

Leaves peltate, repand; *petals* obtuse, some of them fringed. Native of Peru. The flowers are large and showy, orange colored, with spots of deeper shade, the calyx unequally 5-cleft, protracted into a long spur or nectary behind. Leaves a fine example of the form called peltate, the petiole being inserted near the middle. The flowers are eaten for salad, and esteemed very grateful. The fruit is pickled as a substitue for capers. In the evening, the flowers emit, at certain intervals, faint flashes of electrical light, a curious fact first observed by the daughter of Linnæus. *Nasturtion. Indian Cress.*

ORDER XXX. LIMNANTHACEÆ.

Cal.—Sepals 3—5, united at base, persistent, valvate in æstivation
Cor.—Petals 3—5, marescent, inserted upon an hypogynous disk.
Sta.—Twice as many as petals and inserted with them. *Filaments* opposite the sepals, with [a small process outside the base.
Ova.—Of 2—5 distinct carpels. *Sty.* united *Stig.* simple.
Fr.—An achenium, rather fleshy. *Seeds* solitary.

A very small order of small herbaceous plants, mostly natives of the temperate parts of North America. They have no very remarkable properties. Flœrkea is the only northern genus.

FLŒ'RKEA.

Sepals 3, longer than the 3 petals; stamens 6; ovaries 3, tuberculate; style 2-cleft.

Named in honor of Flœrke, a German botanist. Small, aquatic plants, with leaves pinnately divided.

F. PROSERPINACOI'DES. *Lind.* F. uliginosa. *Mh.*

Leaves alternate, those above the water pinnate, those submerged ternate, all on slender stalks. Stem decumbent, less than a foot in length, weak and slender. Petals small, white. Achenia large, two or solitary. Grows in marshes, and on the shores of rivers and lakes. Apr. May. *False Mermaid.*

ORDER XXXI. OXALIDACEÆ.

Cal.—Sepals 5, persistent, equal, sometimes slightly cohering at the base.
Cor.—Petals 5, hypogynous, equal, muguiculate, deciduous, twisted in æstivation.
Sta.—10, hypogynous, more or less monodelphous, those opposite the petals longest.
Ova.—Carpels 5, united, opposite the petals.
Fr.—Capsular, usually membranous, 5-lobed and 5-celled.

A small order of herbaceous plants, inhabiting hot and temperate regions. The stem and leaves generally contain free oxalic acid. This order is represented in the Northern States by the following genus only.

OXA'LIS.

Sepals 5, distinct or united at base; petals much larger than calyx; styles 5, capitate; capsule oblong or subglobose.

Gr. ὀξυς, sour; the leaves of many species are of an acid taste.

* Acaulescent.

1. O. ACETOCE'LLA.

Stemless; *scape* longer than the leaves, 1-flowered; *leaves* ternate; *leaflets* broad-obcordate, with rounded lobes; *styles* as long as the inner stamens; *root* dentate, scaly. Leaves palmately 3-foliate, on long, weak stalks, purplish beneath. Peduncles longer than the leaves, each with a nodding, scentless flower, whose petals are white, yellowish at the base, delicately veined with purple. The whole plant has an agreeable acid taste. Woods and shady places. Flowers in June. Per. *Common Wood-sorrel.*

2. O. VIOLA'CEA.

Stemless; *scape* umbeliferous; *pedicels* sub-pubescent; *flowers* nodding; *leaves* ternate, smooth; tips of the *calyx* fleshy; *styles* shorter than the outer stamens. An elegant species, with purple flowers. Scape rather taller than the leaves, bearing an umbel of 3—9 drooping flowers. Leaves palmately 3-foliate. Leaflets very broadly obcordate. Petals recurved, striate, of a delicate light purple. May. Per. *Violet-colored wood-sorrel.*

** Caulescent.

3. O. STRICTA.

Peduncles umbeliferous; *stem* branching, erect; *leaves* ternate; *leaflets* obcordate; *styles* as long as the inner stamens. This plant varies in hight from 6 to 12 inches or more, according to the soil. Stem leafy, round, smooth, succulent. Leaves palmately 3-foliate, numerous, scattered, on long stalks. Umbels on long, axillary stalks, about the length of the petioles. Flowers small, yellow, appearing all summer. Per. *Yellow Wood-sorrel.*

4. O. CORNICULA'TA.

Pubescent; *stem* branching, creeping, diffuse; *leaves* ternate; *umbels* shorter than the petioles, few-flowered; *petals* wedge-form, erose at the apex; *styles* long as the inner stamens. Grows in Woods. Sometimes called *Ladies Wood-sorrel.* Distinguished readily by its long, creeping stems. Flowers yellow, appearing in May and after.

ORDER XXXIII. ZANTHOXYLACEÆ. *Prickly Ash Tribe.*

Flowers diœcious. Sepals 3—9, small, cohering at the base.
Cor.—Petals longer than the sepals, of the same number or 0.
Sta.—Alternate with petals, of the same number, seldom twice as many; in the pistillate flowers either wanting or imperfect. *Anthers* introrse.
Ova.—Usually of the same number as sepals, stipitate, distinct or united.
Fr.—Baccate, membranaceous or drupaceous, or 2-valved capsules.

An order consisting of trees and shrubs, chiefly of Tropical America, only two genera being found in the United States.

Properties. Bitter, aromatic and stimulant; properties residing chiefly in the bark.

ZANTHOXYLUM.

Perfect fl. Calyx inferior, 5-parted; corolla 0; stamens 3—6; pistils 3—5; carpels 3—5, 1-seeded. *Pistillate fl.* like the perfect, but wanting the stamens. *Staminate fl.* like the perfect, but wanting the pistils.

Gr. ξανθος, yellow, ξυλον, wood; from the color of the wood.

Z. AMERICA'NUM.

Prickly; *leaves* pinnate; *leaflets* ovate, sub-entire, sessile, equal at the base; *umbels* axillary. The prickly ash is a shrub 10 or 12 feet high, growing in woods in most parts of the U. S. The branches are armed with strong, conical, brown prickles with a broad base. Leaflets about 5 pairs, with an odd one, smooth above, downy beneath; common petioles, with or without prickles. Flowers in small, dense umbels, axillary, greenish, appearing before the leaves. The perfect and staminate ones grow upon the same, and the pistilate, upon a separate tree. The bark is bitter, aromatic and stimulant, used for rheumatism and to alleviate the tooth-ache. Apr. May.

Prickly Ash. Tooth-ache-tree.

ORDER XXXIV. ANACARDIACEÆ. *The Cashew Tribe.*

Flowers perfect, sometimes polygamous or diœcious, regular, small.
Cal.—Sepals 3—5, united at base, persistent.
Cor.—Petals same number as sepals, sometimes 0, imbricate in æstivation.
Sta.—As many as petals, alternate with them, distinct, on the base of the calyx.
Ova.—1-celled, free. *Ovule* one. *Styles* 3 or 0. *Stigmas* 3.
Fr.—A berry or drupe, usually the latter and one-seeded.

An order of trees and shrubs, chiefly natives of tropical regions, represented in the United States by the genus Rhus only.

Properties. These plants abound in a resinous juice, which is often poisonous, but is used as an indelible ink in marking linen, and as an ingredient in varnish. Even the *exhalations* from some of the species are deemed poisonous. The Cashew nut is the product of a small tree of both Indies. When fresh the kernel is full of a milky juice, and has a most delicious taste, but the coats are filled with a caustic oil which blisters the skin, and kills warts.

RHUS.

Calyx of 5 sepals united at the base; petals and stamens 5; fruit a small, 1-seeded, subglobose drupe.

Said to be from ῥέω, to flow; because it is useful in stopping hæmorrhage.

* Leaves pinnate.

1. R. GLABRA.

Leaflets smooth, lanceolate, acuminate, acutely serrate, whitish beneath; *fruit* downy. A common Sumach, growing in thickets and waste grounds, 6—12 feet high. The shrub consists of many straggling branches, and is smooth in all its parts. Leaves pinnate, with a dozen or more pairs of leaflets. Flowers in terminal clusters, numerous, dense, greenish-red, succeeded in Autumn by crimson colored drupes. These are at length covered with a whitish crust, extremely acid. The drupes dye red. The bark of this, as well

as the other species, is used in tanning. Lands long neglected are sometimes overrun by this shrub. A variety has diœcious flowers. Jn. Jl.
Smooth Sumach.

2. R. TYPHI'NA.

Branches and *petioles* very villous; *leaflets* oblong-lanceolate, acuminate, acutely serrate, pubescent beneath, in many pairs. A larger Sumach than the former, attaining the height of 20 feet. It grows in low grounds, hedges, &c. The younger shoots and leaf-stalks, are thickly covered with stiff hairs. Leaves pinnate, of many pairs of leaflets. Panicle terminal, dense, oblong. Drupes compact, purple, downy, very acid. The wood is of a sulphur yellow-color, and aromatic odor, dying yellow. Jn. *Stag-horn Sumach.*

3. R. COPALLI'NA.

Leaves pinnate, the petiole winged; *leaflets* oval-lanceolate, entire; *flowers* diœcious. A smaller species, not half the height of the last, in hilly woods, &c. Leaves dark green and shining on the upper surface. The stalk between each pair of leaflets, expands into a leafy margin. Panicle of flowers sessile, greenish. Drupes red. Jl. A variety has the leaflets coarsely serrate.
Mountain Sumach.

4. R. VENENA'TA. *Dc.* R. vernix. *L.*

Very smooth; *leaflets* oval, abruptly acuminate, entire, in many pairs; *panicle* loose; *flowers* diœcious. A shrub or small tree, of fine appearance, growing in swamps. The trunk is several inches in diameter, with diffuse, spreading branches at top. The leaf-stalks are very smooth, wingless, of a fine red color. Leaves pinnate, of about 5 pairs of sessile leaflets, and an odd one stalked. Panicles axillary; those of the barren tree larger and more diffuse. Flowers very small, green. Drupes smooth, whitish. The whole plant is very poisonous to the taste or touch, and even taints the air to some distance around, with its effluvium, rendering it pernicious to breath. In 48 hours after exposure, inflammation appears on the skin, particularly on the extremities, in large blotches, with burning and itching, terminating in watery pustules and eruptions. On some constitutions, it has little or no effect. The varnish called Japan, is a product of this shrub, exuding from incisions made in the bark. Jn. *Poison Sumach. Dog-Wood.*

** Leaves ternate.

5. R. TOXICODE'NDRON.

Erect; *leaflets* ternate, entire or sinuate-lobed, broad oval: *flowers* diœcious. A small shrub, 1—3 feet high, smooth in all its parts. Grows in woods. Leaves large, shining on the upper side. Flowers green, small, in axillary panicles. Poisonous, but in a less degree than the last. Jn.—Jl. *Poison Oak.*

6. R. RA'DICANS.

Stem climbing and rooting. A well known climber, ascending trees to great hights, supported by lateral roots. Leaves ternate, on long stalks, smooth and shining on both sides. Flowers in axillary panicles, small, greenish. Drupes whitish. Common in woods and hedges. Poisonous. The juice is useful for marking linen. Jn. *Poison Ivy.*

7. R. AROMA'TICA.

Leaves ternate; *leaflets* sessile, incisely crenate, pubescent beneath; the lateral ones ovate, the terminal ones rhomboid. Flowers in close aments.

A small shrub, 2—6 feet high, in hedges and thickets, with yellowish flowers, and red fruit. May. *Sweet Sumach.*

* * * Leaves simple.

8. R. COTI'NA.

Leaves simple, obovate; *panicle* racemed, plumose. A small tree, 6 feet high, from S. Europe. It is reared in shrubberies, chiefly remarkable for the very singular and ornamental appearance of its long, diffuse, feathery, fruit stalks, showing in the distance, as if the plant were involved in a cloud of smoke. Flowers small, in terminal, compound panicles. Leaves smooth, entire, much rounded at the end. In Italy the plant is used for tanning.
Venetian Sumach. Smoke-plant.

ORDER XXXVI. AURANTIACEÆ. *The Orange Tribe.*

Cal.—Sepals 3—5, united into a short, urceolate or campanulate cup.
Cor.—Petals 3—5.
Sta.—As many as the petals or some multiple of their number, in a single row, hypogynous.
Ova.—Compounded of several united carpels. *Style* 1.
Fr.—A berry (orange), many-celled, pulpy, covered with a thick rind.
Sts.—Attached to the inner angle of each carpel. *Albumen* 0.

The genera are nearly all natives of Tropical Asia, and are naturalized throughout all Tropical regions, and cultivated in all civilized countries for their beauty and fragrance, both of flowers and fruit.

Properties. These fruits contain free Citric and Malic Acid, and their pulp is grateful to the taste. The rind contains an aromatic volatile oil which is tonic and stomachic. The rind of the Lime yields the Oil of Burgamot, and the flower of the Orange the Oil of Neroli.

CITRUS.

Calyx and petals as above. Anthers 20; filaments in several sets; berry 9—18-celled.

Gr. κιτρια, the Citron, the fruit of one of the species. An ancient and noble genus, combining in its species many excellencies, beauty of form, with shining, evergreen foliage, most odoriferous flowers, and fragrant and delicious fruits. The golden apples of the Heathen, and the forbidden fruit of the Jews, are supposed to refer to these plants. In a splendid work entitled "The Natural History of the Oranges," written in French, by Risso of Nice, in 1818, there are described 169 sorts, and 105 of them figured. They are arranged as sweet oranges, of which are described 42 sorts; bitter and sour oranges, 32 sorts; bergamots, 5 sorts; limes, 8 sorts; shaddocks, 6 sorts; lumes, 12 sorts; lemons, 46 sorts; citrons, 17 sorts. The most successful methods of cultivation are by cuttings.

1. C. LIMO'NUM.

Petioles somewhat winged; *leaves* oblong, acute, dentate; *flowers* with 35 stamens; *fruit* oblong, with a thin rind and very acid pulp. A tree about 15 feet in hight, which, when loaded with its golden fruit suspended among its dark green, shining leaves, makes a most beautiful appearance. It is a native of Tropical regions, and is easily cultivated in our climate, if protected during winter. The petioles are articulated with the lamina. *Lemon Tree.*

2. C. LIME'TA.

Petioles naked; *leaves* ovate, rounded, serrate; *flowers* with 30 stamens; *fruit* globose, with a sweet pulp, and a protuberance at top. This, like most

other species, is a native of Asia. Hight about 8 feet, with a crooked trunk, diffuse branches, with prickles. Berry $1\frac{1}{2}$ inches in diameter, of a greenish yellow, shining surface. *Lime Tree.*

3. C. AURA'NTIUM.

Petals winged; *leaves* elliptical, acute, crenulate; *flowers* with 20 stamens; *fruit* globose, with a thin skin and sweet pulp. A middle sized evergreen tree, with a greenish brown bark. When filled with its large, round, golden fruit, it is one of the most beautiful objects in nature. It is easily cultivated in the green-house. *Sweet-Orange Tree.*

4. C. ME'DICA.

Petioles naked; *leaves* oblong, acute; *flowers* with 40 stamens; *fruit* oblong, rugose, with an acid pulp. Commonly about 8 feet high. Fruit 6 inches in length, very fragrant. *Citron Tree.*

5. C. DECUMA'NA.

Petioles winged; *leaves* obtuse, emarginate; *fruit* very large, with thick skin. A tree 15 feet in hight. The wings of the petioles as broad as the leaves. Fruit grows to the diameter of 7 or 8 inches, weighs 14 pounds, and is of a greenish yellow. *Shaddock.*

ORDER XXXVIII. MALVACEÆ. *The Mallow Tribe.*

Cal.—Sepals generally 5, more or less united at their base, bearing an involucel, valvate [in æstivation.
Cor.—Petals equal in number to sepals, hypogynous.
Sta.—Indefinite, monadelphous. *Anthers* 1-celled, bursting transversely.
Ova.—Of several carpels arranged in one or more rows around a common axis.
Sty.—As many as the carpels, either united or distinct.
Fr.—Capsular or baccate; carpels one or more seeded, united or distinct.
Sds.—Sometimes (as in Gossypium) hairy.

A somewhat important class of plants, forming about one fiftieth of all the flowering plants of tropical vallies.—But few are natives of the temperate, and none of the frigid zone. In the Northern States they are all herbs. Leaves alternate, stipulate, more or less divided.

Properties. Generally abounding in mucillage, and destitute of any deleterious qualities.

Conspectus of the Genera.

Involucels present.	Carpels in one circle. Involucel with	3 cordate leaves,	*Gossypium.* 7
		3 oblong leaves,	*Malva.* 3
		3-cleft, . .	*Lavatera.* 6
		6—9-cleft, .	*Althæa.* 2
		many leaves,	*Hibiscus.* 4
	Carpels irregularly arranged. Involucel 3-leaved, .		*Malope.* 5
Involucels wanting;	capsule of three or more 3-seeded carpels, . .		*Abutilon.* 1

1. ABU'TILON.

Calyx 5-cleft, without an involucel, often angular; ovary 5—many-celled; styles many-cleft; capsule of 5 or more carpels, arranged circularly, each 1-celled, 1—3-seeded.

A genus taken by Lamark from *Sida* of Linn.

A. AVICE'NNÆ. *Gaert.* Sida Abutilon. *L.*

Leaves roundish-cordate, acuminate, dentate, tormentose; *peduncles* shorter than the petiole, solitary; *carpels* about 15, 3-seeded, inflated, 2-awned, truncate. This species is naturalized in most of the States, inhabiting waste pla-

ces, &c. Native of both Indies. Stem branched, 3 or more feet high. Leaves large, deeply cordate at base, velvety. Flowers orange yellow, nearly an inch broad. Jl. Aug. Ann. *Indian Mallow.*

2. ALTHÆ'A.

Calyx surrounded by a 6—9-leaved involucel; carpels numerous; arranged circularly around the axis, 1-seeded, indehiscent.

Gr. αλθω, to cure; the mucilaginous root is highly esteemed in medicine.

1. A. OFFICINA'LIS.

Leaves soft-downy on both sides, cordate-ovate, dentate, somewhat 3-lobed, all entire; *peduncles* much shorter than the leaves, axillary, many-flowered. A European plant, naturalized on the borders of our salt marshes. Stem 3 feet high, erect, firm, covered with thick, woolly down, with alternate, velvet-like leaves. Flowers large, axillary and terminal, pale purple. The root, as well as the other parts of the plant, abounds in mucilage, and in medicine is often used as an emollient to promote suppuration. Aug. Sept. Per. *Marsh Mallow.*

2. A. RO'SEA. Alcea rosea.

Stem upright, hairy; *leaves* cordate, 5—7-angled, rugose; *flowers* axillary, sessile. The Hollyhock is said to grow native in China. It is biennial, of the easiest culture in any common garden soil. Its tall and splendid varieties are, therefore, among the most common of cultivated flowers. Above 20 varieties have been noticed, with single, double and semidouble flowers, of numerous shades of coloring, as white, rose-colored, flesh-colored, dark-red and even a purplish black, purple, yellow, straw-color, &c. Those varieties which depend on color alone, can hardly be perpetuated from their seeds; but from the seeds of the double-flowered varieties, there will generally arise plants of a similar kind. *Hollyhock.*

3. A. FICIFO'LIA.

Stem erect, hairy; *leaves* palmate, 7-lobed beyond the middle; *lobes* oblong, obtuse, irregularly toothed. Native of Levant. Stem tall as the above. Flowers orange-colored. *Fig-leaved Hollyhock.*

3. MALVA.

Calyx 3-cleft, the involucel mostly 3-leaved; carpels numerous, 1-celled, 1-seeded, arranged circularly.

Gr. μαλαχη, soft, altered by the Latins to *Malva*, in allusion to the soft mucilagenous properties of some of the species.

1. M. ROTUNDIFO'LIA.

Stem prostrate; *leaves* roundish, cordate, obtusely 5-lobed; *fruit-stalks* bent downwards; *corolla* twice as long as the calyx. It is a well known plant, common in cultivated grounds and waste places. Root fusiform; stems numerous, lying flat on the ground. The leaves are of a fine, delicate texture, roundish, somewhat reniform, crenate, with 5 or 7 shallow lobes and on long, hairy stalks. Peduncles axillary, aggregate. Petals pale pink, deeply notched. Fruit round and flat, composed of the numerous capsules, arranged circularly.

The child sportively calls them *cheeses*, a name which their form very naturally suggests. Jn.—Oct. Per. *Low Mallow.*

2. M. SILVE'STRIS.

Stem erect; *leaves* 5—7-lobed, sub-acute; *peduncles* and *petioles* hairy. Native of England. A popular garden flower of the easiest culture, often springing up spontaneously. Hight 3 feet. Flowers reddish purple, with veins of a darker hue. The whole plant, especially the root, abounds in mucilage. Jn.—Oct. Per. *High Mallow.*

3. M. MAURITIA'NA.

Stem erect; *leaves* 5-lobed, blunt; *pedicels* and *petioles* smoothish, or downy on the upper side. From S. Europe. A tall species, 4—6 feet high. Stem smooth. Flowers purple, with deeper colored veins. Aug. *Ivy-leaved Mallow.*

4. M. MOSCHA'TA.

Stem erect; radical *leaves* reniform, cut; cauline ones many-parted; *segments* linear; *stems* and *calyxes* hairy. Native of Britain. Stems 2 feet high, branched. Flowers large and handsome, rose-colored. The whole herb gives out a musk-like odor in favorable weather. Jl. *Musk Mallow.*

4. HIBI'SCUS.

Calyx surrounded by a many-leaved involucel; stigmas 5; capsules 5-celled; cells many-seeded.

One of the Greek names of the Mallow.

1. H. MOSCHEU'TOS. *L.* H. palustris.

Stem herbaceous, simple, erect; *leaves* ovate, dentate, subtrilobate, hoary-tomentose beneath; *peduncles* long, axillary, or connected with the petiole. A tall, showy plant, found on the borders of salt marshes, salt springs, river banks, &c. I gathered a flowering specimen at Salina, N. Y., in August. The stem is without a branch, round, downy, 4 feet high. Leaves 3 or 4 inches long, 2 or 3 broad, often with two small, lateral lobes, green above, downy white beneath. Flowers larger than those of the Hollyhock, rose-colored. Peduncles distinct from the petiole, although in some specimens it is found articulated to it, and geniculated above the middle. Outer calyx in many segments; inner in 5. The bark yields a strong, hemp-like fibre, which might make good cordage. Aug. Per. *Marsh Hibiscus.*

2. H. VIRGI'NICUS.

Leaves acuminate, unequally dentate, lower ones cordate, undivided, upper ones oblong-cordate, 3-lobed; *peduncles* axillary and in terminal racemes; *flowers* nodding; *pistils* declinate. The whole plant downy, rough, about 3 feet high. Found on Long Island and in the Middle States, as well as the Southern, growing near the coasts. Flowers red. Aug. Per. *Virginian Hibiscus.*

3. H. SPECIO'SUS.

Very smooth; *leaves* palmate, 5-parted; *lobes* lanceolate, acuminate, subserrate at the end; *capsules* ovate, smooth. A splendid, showy plant, abundant in moist soils in Carolina, is raised from seeds in our gardens, but hardly endures the N. England climate. Root perennial, stem herbaceous, 5—9 feet

high. Each branch terminates in about 3 large flowers, of a rich, shining, carmine red. Aug.—Oct. *Scarlet Mallow.*

4. H. SYRIA'CUS.

Leaves cuneiform, ovate, 3-lobed, dentate; *pedicels* scarcely longer than the petiole; involucel about 8-leaved. A beautiful, hardy, free-flowering shrub, from Syria, 5—10 feet high. Flowers purple. There are varieties with white, red and striped flowers, both single and double. *Syrian Mallow.*

5. H. PHŒNI'CEUS.

Leaves ovate, acuminate, serrate and crenate, lower cordate and tricuspidate; *peduncles* jointed; *seeds* woolly. From E. Indies. Flowers purple. Jn. Per. *Phœnician Mallow.*

6. H. ESCULE'NTIS.

Leaves cordate, 5-lobed, obtuse, dentate; *petiole* longer than the flower; involucel about 5-leaved, caducous. From W Indies, where its pods are used as food. They are pickled, or served up with butter, and being full of mucilage, make a rich dish. *Okro.*

7. H. TRIO'NUM.

Leaves dentate, lower undivided, upper 3-parted; *lobes* lanceolate, middle one very long; *calyx* inflated, membranaceous, nerved. From Italy. An exceedingly beautiful flowerer, branching, 2 feet high. Flowers large, soon withering but numerous. Petals of a rich, chlorine yellow, the base of a deep brown. Ann. *Flower of an Hour.*

5. MA'LOPE.

Calyx surrounded by a 3-leaved involucel; carpels irregularly aggregated, 1-seeded.

A name given by the Greeks to the Tree Mallow.

1. M. GRANDIFLO'RUM.

Leaves nearly smooth, broad, ovate, obtusely 3-lobed, crenate; *bracts* lanceolate; *flowers* solitary, axillary. Stem very branching, red, procumbent, 1—2 feet long. Flower-stalks as long as the leaf, smooth. Calyx of 3 leaves, very cordate at base, ciliate. Inner calyx of 5 deeply cleft, lanceolate segments. Petals large, of a rich purple, veiny. A beautiful garden plant. Jl.—Oct. Ann. *Large-flowering Malope.*

6. LAVATE'RA.

Calyx surrounded by a three-cleft involucel; carpels many, 1-seeded.

Named in honor of two Lavaters, physicians of Zurich.

1. L. ARBO'REA.

Leaves 7-angled, downy, plicate; *pedicels* axillary, 1-flowered, clustered, much shorter than the petiole. A splendid plant for borders or shrubberies, from Europe. It is biennial; hight about 6 feet. Flowers purple. Sept. Oct. *Tree Mallow.*

2. L. THURINGIA'CA.

Leaves somewhat downy; lower, angled, upper, 3-lobed, the middle lobe longest. From Germany. Hight 4 feet. Flowers light blue. Sept. Per. *Gay Mallow.*

7. GOSSY'PIUM.

Calyx surrounded by an involucel of 3 cordate leaves; capsule 3—5-celled; seeds involved in wool.

A word said to be of Arabic origin, from *goz*, a silky substance.

1. G. HERBA'CEUM.

Leaves 5-lobed, mucronate, one gland beneath; *involucre* serrate; *stem* smooth. This is the species commonly cultivated in the Southern States. It is an herbaceous plant, about 5 feet high. The flowers, like those of all the other species, are yellow. Leaves cut half-way down into 3 large, and 2 small, lateral, rounded, pointed lobes. Gland on the mid-rib at its back, half an inch from the base. Jl. Ann. *Common Cotton.*

2. G. BARBADE'NSE.

Upper leaves 3-lobed, lower, 5-lobed with 3 glands beneath; *stem* smoothish. Native, and cultivated in the W. Indies. A larger plant than the foregoing. Sown in Sept. and Oct. An acre yields an average product of 270 pounds of this cotton. Bien. *Barbadoes Cotton.*

ORDER XXXIX. TILIACEÆ. *The Linden Tribe.*

Cal.—Sepals 4—5, deciduous, valvate in æstivation.
Cor.—Petals 4—5, hypogynous; glands 4—5, at their base.
Sta.—Indefinite, distinct, hypogynous. *Anthers* versatile.
Ova.—Carpels 2—10, united. *Style* 1, compound. *Stigma* as many as carpels.
Fr.—Capsular, 2—5-celled, with numerous seeds. Cotyledons leafy.

A family of trees, with a few shrubs, native in all regions, but especially within the Tropics.

Properties. These plants abound in a wholesome, mucilaginous juice. The inner bark is remarkable for toughness, and is useful for various purposes, as fishing lines, nets, rice-bags, &c.

TI'LIA.

Calyx of 5 united sepals, deciduous; petals 5; capsules superior, globose, 5-celled, 5-seeded, opening at the base.

Lat. *tilia*, the *Linden-tree*, *Lime-tree*, *Bass-wood*. Cal. inferior, colored. Cor. of 5 oblong, obtuse petals, crenate at the summit, as large as the calyx. Fil. numerous, large as the cor. Anth. 2-lobed. Ova. superior. Seeds solitary, roundish.

T. AMERICA'NA.

Leaves cordate, abruptly acuminate, finely serrate, coriaceous, smooth; *petals* truncate at the top; *fruit* ovate. This is a common forest tree in the Northern and Middle States. It frequently grows to the hight of 80 feet, with a straight and even trunk, more than half this length, and 2 or 3 feet diameter. The leaves are large, nearly round, heart-shaped at the base. The

leaves of the shoots which arise from the stump and roots, are remarkable for their large size. The flowers are distinguished for their peculiar inflorescence. They are in little clusters on a foot-stalk, proceeding obliquely from the centre of a long, narrow, floral leaf. Color green and yellow. The inner bark is very strong, and manufactured into ropes. The wood is white, soft and clear, much used in cabinet-work, and the panneling of carriages. Jl.

Bass-wood. Lyme-Tree.

ORDER XLII. VITACEÆ. *The Vine Tribe.*

Cal.—Minute, nearly entire or 5-toothed. [often cohering above, and caducous.
Cor.—Petals 4—5, inserted on the outside of the disk, valvate and inflexed in æstivation,
Sta.—4—5, opposite the petals, inserted upon the disk.
Ova.—Superior, 2-celled. *Style* 1, very short. *Fruit* a berry, globose, pulpy. *Seeds* bony.

Shrubs climbing by tendrils. Lower leaves opposite, upper ones alternate. Flowers racemed. Native of the warmer parts of both hemispheres. The Grape fruit is the only important production of this order. The acid of the grape is tartaric. It contains a sugar, which differs from the common sugar in containing a smaller quantity of carbon.

Genera.

Torus elevated into a ring surrounding the ovary. Leaves cordate, &c.,	*Vitis.*	1
Torus without a ring. Leaves digitately 5-foliate,	*Ampelopsis.*	2

1. VITIS.

Petals deciduous, cohering at the top, or distinct and spreading; ovary partly enclosed within the torus, 2-celled; cells 2-ovuled; stigma sessile, capitate; berry 1-celled, 1—4-seeded.

Celtic *gwyd*, a tree or shrub.

1. V. LABRU'SCA.

Leaves broad cordate, angular lobed, tomentose beneath. This vine is native through the U. S., growing in woods and groves. Like most of the N. American species, the flowers are diœcious. Stem woody, rough-barked, ascending trees often to a great hight, and hanging like cables suspended from the branches. Leaves very large, somewhat 3-lobed, at first white-downy beneath. Flowers small, green, in panicles with a leaf opposite. Fruit large, purple, often green or red. It is valued in cultivation for its deep shade in summer arbors, and its fruit which is pleasant in taste. The Isabella, and other sorts known in gardens, are varieties of this species.

2. V. CORDIFO'LIA. *Mx.* V. vulpina. *L.*

Leaves cordate, acuminate, somewhat equally toothed, smooth on both sides; *racemes* loose, many-flowered; *berries* small. Grows in thickets, by rivers, &c., ascending shrubs and trees to the hight of 10—20 feet. Leaves large, membranous, often 3-lobed, with pubescent veins when young, and with a few mucronate teeth. Berries nearly black, rather small, late, acid, but well flavored after frosts of November. Jn. *Frost Grape. Winter Grape.*

3. V. ÆSTIVA'LIS.

Leaves broadly cordate, 3—5-lobed or palmate-sinuate, coarsely dentate, with scattered ferruginous hairs beneath; *fertile racemes* long, panicled; *berries* small. Grows in woods, by rivers, &c. Stem very long, slender, climbing, with very large leaves, which are sometimes with deep, rounded sinuses,

clothed beneath when young, with arachnoid, rust-colored pubescence. Tendrils from the peduncles, which are dense flowered, and with a leaf opposite. Petals cohering at summit. Berries deep blue, well flavored, but small, ripe in September. Flowers in June. *Summer Grape.*

4. V. VINI'FERA.

Leaves cordate, 5-lobed, sinuate, naked. Naturalized in almost all temperate climates, but supposed not to be indigenous in this country. No plant in the vegetable kingdom possesses more interesting attributes, is cultivated with greater care, or, let me add, has been worse perverted or abused by mankind, than the common vine. By cultivation it sports into endless varieties, differing in the form, color, size, and flavor of the fruit, and in respect to the hardiness of its constitution. In N. England its cultivation is chiefly confined to the garden, and is a dessert fruit; but there are extensive vineyards in the Middle and Western States, for the production of wine. The vine is propagated by cuttings. Varieties without end may be raised from the seed, which will bear fruit the fourth or fifth year. A vineyard, it is said, will continue to produce fruit for 200 years. *Common Wine Grape.*

2. AMPELO'PSIS.

Calyx entire; petals 5, distinct, spreading; ovary 2-celled, cells 2 ovuled; style very short; berry 2-celled, cells 1—2-seeded.

Gr. αμπελος, a vine, οψις, appearance; the genus resembles the vine in habits, leaves, and flowers. Woody vines, with digitate leaves.

A. QUINQUEFO'LIA.

Leaves quinate, digitate; *leaflets* oblong, acuminate, petiolate, dentate, smooth. A vigorous climber, found wild in the woods and thickets. It has long been cultivated as a covering for walls, and is best known by the name of *Woodbine.* By means of its radicating tendrils, it supports itself firmly upon trees, ascending to the hight of 50 feet. In the same manner it ascends and overspreads walls and buildings. The large quinate leaves constitute a luxuriant foliage of dark, glossy green. Flowers inconspicuous, greenish, in dichotomous clusters. Berries dark blue, smaller than peas, acid. Jl.
Virginian Creeper. Woodbine.

ORDER XLIII. ACERACEÆ. *The Maple Tribe.*

Cal.—Sepals 5, rarely 4—9, more or less united, colored, imbricate in æstivation.
Cor.—Petals 5, rarely 4—9, hypogynous; sometimes 0.
Sta.—hypogynous, 3—12, usually 8. *Anth.* introrse or versatile.
Ova.—2-lobed, compounded of 2 united carpels.
Fr.—A double samara, with opposite wings, thickened at the lower edges.

An order of trees and shrubs, with opposite leaves without stipules. Flowers often diœcious or polygamous. The sap of several species of the Maple yields sugar by evaporation.

Genera.

Flowers mostly polygamous. Leaves simple, ...	*Acer.*	1
Flowers diœcious. Leaves compound, pinnate, ...	*Negundo.*	2

1. ACER.

Flowers mostly polygamous; calyx 5 cleft; corolla 5 petaled or 0; stamens 8; styles 2; samaræ 2, winged, united at base, byabortion 1-seeded.—Leaves simple.

Lat. *acer*, sharp, vigorous. The wood of the Maple, was anciently manufactured into the heads of pikes and other sharp weapons.

* Trees. Flowers corymbose, &c.

1. A. RUBRUM.

Leaves palmate, 5-lobed, cordate at base, unequally and incisely toothed, the sinuses acute, glaucous beneath; *flowers* aggregate, about 5 together, on rather long pedicels; *ovaries* smooth. The red maple is a common tenant of low woods and swamps throughout the Atlantic states. It is a tree somewhat above the middle size. The trunk is covered with a smooth bark, marked with large, white spots, becoming dark with age. In spring, the appearance of the tree is remarkable for the deep crimson flowers, with which it is thickly clothed. Each bud gives birth to a fascicle of about 5 flowers. Stamens much exserted. The fertile flowers are succeeded by a red fruit, furnished with a pair of wings resembling those of some insect. The wood is hard and compact, and is much used in cabinet-work, particularly that well known and handsome variety called *curled maple*. *Red Maple. Swamp Maple.*

2. A. DASYCA'RPUM.

Leaves palmate, 5-lobed, truncated at base, unequally and incisely toothed, with obtuse sinuses, white and smooth beneath; *flowers* in crowded, simple umbels, with short *pedicels* and downy *ovaries*. This species much resembles the last, but its leaves are larger, and the winged fruit is also larger than that of the red maple or of any of the following species. It is a tall tree 50 feet in hight, not uncommon in the N. England forests. The flowers are of a yellowish green color, as also the fruit. The wood is white, softer and less esteemed than that of other species. The sap yields sugar in smaller proportion than the sugar maple. *White Maple.*

3. A. SACCHARI'NUM.

Leaves palmate, 5-lobed, subcordate at base, acuminate, remotely toothed, with rounded and shallow sinuses, glaucous beneath; *flowers* pedunculate, corymbose, nodding. This fine tree is most abundant in the primitive soils of N. England, constituting the greater part of some of its forests. It is a tree of lofty proportions, 70 feet in hight, with a trunk 3 feet in diameter. The bark is of a light gray color, rough and scaly. The branches become numerous and finely ramified in open situations, and in summer are clothed with a foliage of uncommon luxuriance and beauty, on which account it is more extensively cultivated as a shade tree than any other, not even excepting the majestic and favorite elm. Maple sugar, perhaps the most delicious of all sweets, is almost wholly the product of this species. An ordinary tree will yield 20—30 gallons of sap in a season, some, twice or three times as much. It is obtained by inserting spouts in holes bored in the trunk. When collected, it is concentrated by evaporation until it crystallizes or *grains*, yielding sugar in the proportion of about a pound to four gallons. The wood of the rock maple is very strong and compact, and makes the best of fuel. It is sometimes curled like the red maple, but oftener presents that beautiful arrangement of fibre, called *bird's eye maple*, which is highly esteemed in cabinet-work. Apr. *Sugar Maple. Rock Maple.*

** Shrubs. Flowers in racemes.

4. A. PENNSYLVA'NICUM. *L.* A. Striatum. *Lam.*

Leaves with 3 acuminate lobes, rounded at base, sharply denticulate, smooth; *racemes* simple, pendulous. A small tree or shrub, 10—15 feet high. Found

in our northern woods. The bark is smooth, and beautifully striped lengthwise with green and black. Flowers large, yellowish green, succeeded by long clusters of fruit, with pale-green wings. The smaller branches are straight and smooth, easily separated from the bark in spring, and are often manufactured by the boys into certain wind instruments. Hence it is called whistle-wood. In Europe it is highly prized in ornamental gardening. May.
Striped Maple. Whistle-wood.

5. A. SPICA'TUM. *Lam.* A. montanum. *Ait.*

Leaves about 5-lobed, acute, dentate, pubescent beneath; *racemes* erect, compound. A shrub of smaller stature than the last, found in mountain or hilly woods throughout the country. The bark is a light gray. Leaves small, rough, divided into 3 or 5 lobes, which are somewhat pointed with large, sharp teeth, and more or less cordate at base. Flowers greenish, numerous and minute, in cylindric, oblong, close, branched clusters, becoming pendulous with the winged fruit. Jn. *Mountain Maple Bush.*

2. NEGU'NDO.

Flowers diœcious; Corolla 0; fertile flowers racemed; staminate flowers fascicled; leaves compound, of 3—5 leaflets.

A fine, ornamental tree, distinguished from the genus Acer chiefly by its pinnate leaves. Calyx, stamens, styles and fruit as in the last genus.

N. ACEROI'DES. *Mœnch.* Acer Negundo. *L.*

Leaves ternate and 5-pinnate; *leaflets* ovate, acuminate, remotely and unequally dentate; *fertile flowers* in long, pendulous racemes; *barren flowers* corymbose; *fruit* oblong, with large wings dilated upwards. A handsome tree, 20—30 feet in hight, with irregular, spreading branches, growing in woods. The trunk is a foot or more in diameter, and when young, covered with a smooth, yellowish-green bark. Leaflets serrated above the middle, petiolate, the terminal one largest, all slightly pubescent. Wings of the samara approximate, broadest towards the end. Apr. *Ash-leaved Maple. Box-Elder.*

ORDER XLIV. HIPPOCASTANACEÆ. *Horse-Chestnut Tribe.*

Cal.—Campanulate, of 5 united sepals.
Cor.—Petals 5 (one of them sometimes abortive), unequal, hypogynous.
Sta.—6—8, distinct, unequal, inserted upon a disk with the petals.
Ova.—Roundish, 3-cornered, 3-celled, crowned with a single, filiform, conical style.
Fr.—Roundish, coriaceous, with 1—3 large, roundish, smooth seeds.

Native of N. America and Northern India. The species are generally ornamental trees, with astringent properties residing in the bark. The seeds contain much starch, and are nutritive, but bitter.

Only the following genus is found in the Northern States, and even this is not indigenous.

Æ'SCULUS.

Calyx campanulate or tubular, 5-lobed; corolla irregular, 4—5-petaled; stamens, ovary and fruit as expressed in the order.

Æ. HIPPOCA'STANUM.

Leaves digitate in 7s; *petals* 5, spreading; *capsule* prickly. A noble tree, justly admired for its majestic proportions, and for the beauty of its foliage

and flowers. It is a native of the north of Asia, but is now known throughout Europe and in this country, and is a frequent ornament of courts and avenues. It is of rapid growth, and attains the hight of 40 or 50 feet. In June it puts forth numerous pyramidal racemes or thyrses of flowers, of pink and white, finely contrasting with the dark green of its massy foliage. The leaves are digitate, with seven obovate, acute, serrate leaflets. The fruit is large, mahogany-colored, and eaten only by deer. *Horse-Chestnut.*

ORDER XLVI. CELASTRACEÆ. *The Staff-tree Tribe.*

Cal.—Sepals 4—5, united at base, imbricated. [panded disk which surrounds the ovary.
Cor.—Petals as many as sepals, inserted by a broad base under the margin of the flat, ex-
Sta.—As many as the petals and alternate with them, inserted on the margin of the disk.
Ova.—Superior, immersed in, and adhering to the disk.
Fr.—A capsule or berry. *Seeds* either with or without an arillus.

Chiefly native of the Temperate Zone of both hemispheres. The species of N. America are chiefly shrubs, the leaves opposite or alternate. They possess acrid and bitter properties, sometimes emetic and stimulant.

Genera.

Shrubs with leaves	opposite, compound (ternate),	*Staphylea.*	1
	opposite, simple,	*Euonymus.*	3
	alternate, simple,	*Celastrus.*	2

Tribe 1, STAPHYLEÆ.

Leaves pinnate, opposite. Seeds not arilled. Cotyledons thick.

1. STAPHYLE'A.

Flowers perfect; calyx of 5, colored, persistent sepals; petals and stamens 5; styles 3; capsules 2—3, membranous and inflated.

A Greek word, meaning a bunch; from the form of the fructification. Shrubs. Leaflets involute in vernation. Flowers white.

S. TRIFO'LIA.

Leaves ternate; *racemes* pendulous; *petals* ciliate below; *fruit* ovate. A handsome shrub, 6—8 feet high, in moist woods and thickets. Leaflets oval-acuminate, serrate, pale beneath, with scattered hairs. Flowers white, in a short, drooping raceme. The most remarkable feature of the plant is its large, inflated capsules, which are 3-sided, 3-parted at top, 3-celled, containing several hard, small nuts or seeds, with a bony, smooth and polished testa. May. *Bladder-nut.*

Tribe 2, EUONYMEÆ.

Leaves simple. Seeds usually arilled. Cotyledons leafy.

2. CELA'STRUS.

Flowers sometimes polygamous; calyx flat, of 5 united sepals; corolla spreading, of 5 sessile petals; capsule subglobose, or 3-angled, 3-celled; seeds with an arillus, 1—2 in each cell.

A Greek name, given to a certain evergreen tree, of which pails and other vessels were made. Climbing shrubs, with alternate leaves and minute deciduous stipules.

C. SCA'NDENS.

Unarmed; *stem* woody, twining; *leaves* oblong, acuminate, serrate; *racemes* terminal. Flowers diœcious. A climbing shrub in woods and thickets, the stems twining about other trees or each other, ascending to a great hight. Leaves alternate, stipulate, petiolate, smooth. Flowers in small racemes, greenish white. Seeds covered with a scarlet aril, and contained in a 3-valved capsule, continuing upon the stem through the winter. Jn. *Staff-tree.*

3. EUO'NYMUS.

Calyx flat, of 5, (sometimes 4 or 6) united sepals; corolla flat, inserted on the outer margin of a glaudular disk; stamens 5, with short filaments; capsule colored, 5-angled, 5-celled, 5-valved; seeds ariled.

Euonymus, was the name of a certain deity in Grecian mythology, but its application to this plant is unexplained.

E. ATROPURPU'REA.

Peduncles compressed, many-flowered; *stigmas* square, truncated; *leaves* oblong, lanceolate, acuminate, serrate, pubescent beneath. A shrub, 5 feet high, with opposite branches and deciduous leaves. Flowers purple, in axillary clusters. Corolla and other parts of the flower, usually in 4s. Capsules crimson, smooth. Seeds covered with a bright red aril. Jn.
Spindle-tree. Burning Bush.

E. AMERICA'NA.

Peduncles round, 3-flowered; *leaves* oval or oblong-lanceolate, sessile, acute, serrate, smooth; *branches* 4-angled; *corolla* and other parts of the flower mostly in 5s. A handsome shrub, of smaller size than the preceding, with opposite, square, slender, green branches and smooth evergreen foliage. Leaves thick and leathery, varying from ovate-lanceolate through oval to oblanceolate. Flowers pink and yellow, 1—3 together, axillary. Capsules dark red, warty. Seeds with a bright red aril. *Burning Bush.*

ORDER XLVII. RHAMNACEÆ. *The Buck-Thorn Tribe.*

Cal.—Sepals 4 or 5, united at base, valvate in æstivation. [sometimes 0.
Cor.—Petals 4 or 5, distinct, cucullate or convolute, inserted into the orifice of the calyx,
Sta.—Opposite the petals, 4 or 5.
Ova.—Superior, or half superior, with an erect ovule in each cell.
Fr.—A capsule, drupe or berry.

Trees or shrubs, often armed with spines. Leaves generally alternate and simple. This family of plants is distributed throughout all countries, except those in the Frigid Zones. Many are native of the U. States. Ceanothus is peculiar to North America.

Properties. The berries of many species of Rhamnus are violent purgatives. The Zizyphus Jujuba, yields the well known *jujube paste* of the shops. The leaves of Ceanothus have been used as a substitute for tea.

Genera.

Calyx free from the ovary; petals plane; flowers minute, ...	*Rhamnus.*	1
Calyx adherent to the ovary at base; petals unguiculate, ...	*Ceanothus.*	2

1. RHAMNUS.

Calyx urceolate, 4—5-cleft; petals 4—5, emarginate, inserted upon the calyx; ovary free, 2—4-celled; styles 2—4, more or less united; fruit drupaceous, 3—4-seeded.

The Greek name for a thorn bush. Small trees or shrubs, with alternate lvs.

1. R. CATHA'RTICUS.

Flowers tetrandrous; *shrub* erect, with thorny *branches; leaves* ovate, doubly serrate; *flowers* polygamous and diœcious, fascicled; *fruit* sub-globose, 4-seeded. A shrub, 10—15 feet high, in mountains and woods. Leaves nearly smooth, in crowded clusters at the ends of the branchlets. Flowers small, numerous, green. Sepals reflexed; petals entire. Fruit black, globose, and with the inner bark, powerfully cathartic. This shrub is sometimes used for hedges. *Buck Thorn.*

2. R. ALNIFO'LIUS. *L'Her.* R. franguloides. *Mx.*

Flowers mostly pentandrous; *shrub* erect, with unarmed *branches; leaves* oval, acuminate, serrate, pubescent on the veins beneath; *peduncles* aggregate, 1-flowered; *calyx* acute; *styles* three, united, very short; *fruit* turbinate, black. A shrub common in rough hills and pastures. Berries about the size of a currant, 3-seeded. May. Jn. *Alder-leaved Buckthorn.*

CEANO'THUS.

Calyx tubular, 5-cleft; corolla of 5, saccate-arched petals; berry dry, 3-celled, 3-seeded.

A Greek name applied to some prickly plant. Petals with long claws, standing in the turbinate calyx. Caps. tricoccous, 3-parted, opening on the inner side. Shrubby and thornless.

1. C. AMERIC'ANA.

Leaves oblong-ovate, serrate, 3-nerved; *panicles* axillary, elongated. A small shrub, with a profusion of white blossoms, found in woods and groves. Stems 2—4 feet high, slender, with reddish, round, smooth branches. Leaves alternate, thrice as long as broad, very downy with soft hairs beneath. Flowers minute, white, in crowded panicles from the axils of the upper leaves. Stamens enclosed in the curiously vaulted corolla. The root, which is large and red, is sometimes used for coloring. The leaves have been used as a substitute for tea. Flowers in June. *Jersey Tea.*

2. C. OVA'LIS.

Leaves oval-lanceolate, with glandular serratures, 3-nerved, nerves pubescent beneath; *thyrse* corymbose, abbreviated. Found on the shores of Lake Champlain. Flowers white, larger than those of the last, and in short or hemispherical panicles. May. *Smooth-leaved Ceanothus.*

ORDER XLVIII. ROSACEÆ. *The Rose Tribe.*

Cal.—Sepals 5, rarely fewer, united, often reinforced by as many bracts. [calyx.
Cor.—Petals 5, regular, rarely wanting, inserted on the disk which lines the orifice of the
Sta.—Indefinite, usually numerous, arising from the calyx, distinct. [each other.
Ova.—Superior, 1 or several, distinct, 1-celled; often coherent to the sides of the calyx and
Styles—distinct or united. *Fruit* a drupe, pome, achenia or follicle.

A large family, composed of trees, shrubs and herbs. Leaves alternate, often accompanied with conspicuous stipules. Flowers regular, often large and beautiful. The genera of this order are chiefly natives of temperate climates north of the equator.

Properties. A highly important order, whether we regard its delicious fruit, its medicinal products, or the beauty of its flowers. None of its species (excepting those of the Almond tribe) are unwholesome. An astringent principle characterizes the family, residing chiefly in the bark and the roots. The roots of the Blackberry, have been used in medicine as an

astringent; those of Gillenia, as an emetic; Agrimonia, as a vermifuge. The petals of Rosa Damascena, yield the well known fragrant oil, called *attar of rose*. The Almond, Peach, &c. abound in Prussic acid, a deadly poison, residing chiefly in the leaves and flowers.—Of the Rosaceæ, as ornamental flowering shrubs it is scarcely necessary to speak.

Conspectus of the Genera.

Achenia.			Caulesc.	*Potentilla.*	9
		Lvs. com.	Acaules	*Waldsteinia.*	13
		Sty. decid.	Leaves simple,	*Dilabarda.*	12
		a dry recep.	& caudate with the persist. style,	*Geum.*	14
			which is sweet and eatable in	*Fragaria,*	11
		a juicy recp.	but insipid in . . .	*Comarum.*	10
	3—many, on		Flowers perfect,	*Sanguisorba.*	15
	na- dry, 1—2;	Calyx 4-cleft, unarmed:	Fls. monœcious,	*Poterium.*	17
		Calyx 4-cleft, armed with hooked bristles,		*Agrimonia.*	16
	ked, drupaceous. aggregated upon a juicy receptacle. Prickly,			*Rubus.*	8
	enclosed within the cavity of the thickened calyx. Prickly shrubs,			*Rosa.*	7
Follicles nearly or quite distinct,		3—5; unarmed shrubs,	. . .	*Spiræa.*	18
		5; herbs with 3-foliate, cauline leaves.		*Gillenia.*	19
			Branches thorny.	*Crataegus.*	4
		Petals roundish:	Branches unarmed,	*Pyrus.*	5
Trees and shrubs;	*Pome* inferior;	Pet. oblong; pome with 5 double cells,		*Amelanchier.*	6
			compressed; fruit glaucous.	*Prunus.*	2
	Drupe superi.;	Nucleus smooth,	globose; fruit not glaucous.	*Cerasus.*	1
		Nucleus perforated with pits and furrows,		*Amygdalus.*	3

Suborder 1, AMYGDALEÆ.

Ovary solitary. Fruit a drupe. Seed mostly solitary. Calyx deciduous.

1. CE'RASUS.

Calyx 5-cleft, deciduous; petals much spreading; stamens 15—30; drupe globose, fleshy, destitute of a glaucous bloom; nucleus roundish, smooth.

Name from Cerasus, a town in Pontus, from whence the garden cherry was first brought into Europe.

* Flowers in racemes.

1. C. SEROTI'NA. *Dc.* C. Virginiana. *Mx.*

Racemes erect, elongated; *leaves* deciduous, oval-oblong, acuminate, unequally serrate, smooth, shining above; *petioles* with 2—4 glands. The wild cherry is with us, a well known, large forest tree, 40 or 50 feet in hight, with a diameter of a foot or more. On the banks of the Ohio, it towers to the hight of 80 or 100 feet, with a trunk of uniform size, undivided to the hight of 25 or 30 feet, and 3—5 feet in diameter. The bark is black and rough. Leaves of a fine green, 5 or 6 inches long, with 1 or 2 pairs of reddish glands at the base. In May and June it puts forth its numerous cylindric clusters of white flowers. Fruit nearly black when mature, bitterish, yet pleasant to the taste, and greedily devoured by the birds. The wood is extensively used in cabinet-work; it is compact, fine-grained, and receives a high polish. The bark has a strong, bitter taste, and has been used in medicine as a tonic.

Wild Cherry. Black Cherry.

2. C. VIRGINIA'NA. *Dc.* C. serotina. *Hook.*

Racemes lax, at length pendulous; *leaves* smooth, sharply serrate, oval, deciduous, the lower serratures glandular; *ribs* bearded on each side towards the base; *petiole* with 2 glands. A small tree or shrub, 5—20 feet high, in woods and hedges. It flowers in June, and yields an abundance of fruit of a dark red color, which is not unpleasant to the taste, though astringent and bitter. The cherries are about as large as those of the preceding species.

Choke Cherry.

** Flowers subumbellate or solitary.

3. C. PENNSYLVA'NICA. *A.* C. borealis. *Mx.*

Corymbs with elongated pedicels; *leaves* oblong-ovate, acuminate, erose, membranous, smooth; *fruit* subovate. The Red Cherry-tree is common in the Northern States. It rarely exceeds 25 feet in hight, with a diameter of 6—8 inches. The bark is smooth, brown. Leaves 5 or 6 inches long, oval, denticulate, with a long point. Flowers white, collected in a sort of umbel. Fruit red, very acid. It is of rapid growth, and quickly succeeds a forest clearing if neglected. May. *Red Cherry.*

4. C. PU'MILA. *L. & Mx.* C. depressa. *P.*

Leaves lanceolate, oval or obovate, acute, subserrate, smooth, paler beneath; *umbels* sessile, few-flowered. A small trailing shrub, on sandy shores. Fruit small, ovate, black, agreeable to the taste. May. *Sand Cherry.*

5. C. HORTE'NSIS.

Umbel sub-pedunculate; *leaves* ovate-lanceolate, smooth, folded together. This tree is quite common, cultivated as well for its fine, shady foliage, as for its excellent fruit. The tree is about 20 feet high, flowering in May. Several varieties are produced, differing in respect to the form, taste, color, &c. of the fruit. It is native in many parts of Europe. *Garden Cherry.*

2. PRUNUS.

Calyx 5-cleft, deciduous; petals much spreading; stamens 15—30; ovary 2-ovuled; drupe ovate, fleshy, smooth, generally covered with a glaucous bloom; nucleus, compressed, smooth.

Greek and Latin names the same; derivation unknown. Small tree or shrub. Leaves convolute in vernation.

1. P. MARI'TIMA.

Leaves oval or obovate, slightly acuminate, shaply serrate; *petioles* with 2 glands; *umbels* few-flowered; *pedicels* short, pubescent; *fruit* nearly round. A small shrub, abundant on the sea beach, particularly on Plum Island, at the mouth of Merrimac river. Fruit large, pulpy, little inferior in size to the common garden plum. May. *Beach Plum.*

2. P. AMERICA'NA.

Somewhat thorny; *leaves* oblong-oval and obovate, abruptly and strongly acuminate, doubly serrate; *drupe* roundish-oval, reddish-orange, with a thick, coriaceous skin. Hedges and low woods, often cultivated for its sweet, pleasant fruit, which is about the size of the damson. The shrub is 10—15 feet high. May. Fruit ripe in Jl. Aug. *Red Plum. Yellow Plum.*

3. P. DOME'STICA.

Peduncles nearly solitary; *leaves* ovate-lanceolate, convolute; *branches* unarmed. The garden plum, long cultivated in this country and throughout Europe, is said to be originally from France. Among its more common varieties, are the *Juliana*, damson plum, fruit oblong, blue; the *Claudiana*, sweet plum, fruit round, yellowish; the *Enucleata*, stoneless plum, fruit without the putamen. *Garden Plum.*

4. P. ARMENI'ACA.

Flowers sessile; *leaves* subcordate. The Apricot is said to be a native of Levant. It is a tree of small size, bearing fruit next in esteem to the peach. There are many varieties. The trees are generally budded on plum-stocks, and trained against walls. *Apricot.*

3. AMY'GDALUS.

Calyx 5-cleft, inferior; petals 5; drupe with a nut perforated on its surface.

The Greek name of the almond.

1. A. PE'RSICA.

Leaves with all the serratures acute; *flowers* sessile, solitary. The exquisite fruit of the Peach and Nectarine, are sufficiently known and appreciated. The richness and delicacy of its juicy pulp, render it superior to the grape or the apple, and inferior in these respects only to the pine-apple. This species is divided by Linnæus, into two varieties; that with downy fruit, or the peach, and that with smooth fruit, or the nectarine. But of these there are also many varieties produced from the seed. The peach, in order to attain its proper flavor in the Northern States, should be protected with glass in the spring and earlier months of summer, and exposed to the direct rays of the sun afterwards, to ripen; but in the Middle and Western States, it attains to its perfection without protection or culture, when once planted in good loamy soil. The double-flowered peach, is a highly ornamental tree, blossoming in May. From Persia. *Common Peach. Nectarine.*

2. A. COMMU'NIS.

Lower serratures of the leaves glaudular; *flowers* sessile, in pairs. The Almond is employed as an ornamental tree in shrubberies. In some countries of S. Europe, it is cultivated for its fruit. The sweet Almond is used for food, is pleasant to the taste, but dry and difficult of digestion. The variety *Amara*, bitter Almond, is distinguished only by the taste, and contains prussic acid to a degree, which renders its extract narcotic and very poisonous. Flowers in April and May. From Barbary. *Almond.*

3. A. NANA.

Leaves ovate, alternate at base, simply and finely serrate. A very ornamental shrub from Russia. Hight about 3 feet. The flowers, which are often double, are large, red, appearing in April, while the leaves are yet small. *Flowering Almond.*

SUBORDER II, POMEÆ.

Ovaries 2—5 (*rarely* 1), *cohering with the sides of the persistent calyx, and with each other Fruit a pome.*

4. CRATÆ'GUS.

Calyx 5-cleft, campanulate, superior; petals 5; ovaries 1—5, with terminal styles; fruit a pome, with 1—5 1-seeded nuts, or bony cells.

Gr. κρατος, strength; on account of the extreme hardness of the wood of some of the species. Cal. perm. Pet. round, spreading. Styles smooth. Pome oblong, concave at top, closed with the teeth of the calyx. Trees or shrubs.

1. C. COCCI'NEA.

Thorny; *leaves* on long petioles, ovate, subcordate, acutely lobed, serrate, smooth; *petioles* and *pubescent calyx* glandular; *styles* 5. A small tree or shrub, 20 feet high, in woods and thickets. The spines are long, rigid and acute. Flowers white, corymbed. Fruit scarlet-color, well flavored. May. *Thorn Bush.*

2. C. TOMENTO'SA. *L.* C. pyrifolia. *Ait.*

Thorny or not; *leaves* oval-elliptic, cut-serrate, somewhat plaited and hairy; *calyx* villous; *segments* linear-lanceolate, serrate; *styles* 3. A large shrub, 12—15 feet high, with large leaves and white flowers. Jn. *Pear-leaf Thorn.*

3. C. CRUS-GA'LLI.

Thorny; *leaves* obovate, serrate, coriaceous, smooth; *flowers* in terminal corymbs; *leaves* of the calyx lanceolate, subserrate; *styles* 1—2. A small, branching tree or shrub, about 20 feet high. Thorns two or three inches long, straight, rigid, acute. Flowers white, fragrant. Fruit nearly red, remaining upon the tree during the winter, unless eaten by the birds. May. *Common Thorn.*

β. *splendens*; *leaves* shining. γ. *pyracanthifolia*; *leaves* oblong-lanceolate, somewhat wedge-shaped. δ. *salicifolia*; willow-leaved.

4. C. OXYCA'NTHA.

Leaves obtuse, subtrifid, serrate, smooth; *peduncles* and *calyx* nearly smooth; *sepals* lanceolate, acute. This is the common hedge-hawthorn, so extensively cultivated for fences in England and other countries of Europe. *Hawthorn.*

5. C. PUNCTA'TA.

Leaves cuneiform, obovate, tapering into a petiole at base, the veins strongly marked and pubescent beneath; *calyx* pubescent when young; *styles* 3 or fewer; *fruit* roundish, punctate. A tree 20 feet or more in hight, generally armed with stout spines. The branches are wide-spreading, forming a head large in proportion to the hight of the tree. Leaves thin, with straight veins. Fruit large, eatable. May. *Thorn.*

5. PYRUS.

Calyx superior, 5-cleft; corolla of 5 roundish petals; styles 2—5; pome 2—5-celled, fleshy, baccate; cells 2-seeded; testa cartilaginous.

Celtic *peren*; Anglo-Saxon, *pere*; Fr., *poire*; Lat., *pyrus*; Eng., *pear.*—From the Celtic *api*, a fruit, the Greeks obtained ἄπιος, and the English apple. Cal. segments deep, perm. Pet. roundish, much longer than cal., and longer than the stam. Styles 2—5. Trees or shrubs, with flowers in terminal, corymbose cymes. Fruit eatable.

1. P. AMERICA'NA. *Dc.* Sorbus Americana. *P.*

Leaves pinnate; *leaflets* somewhat unequally serrate, smooth; *petioles* smooth. A small tree in mountain woods, common in Me., N. H. and Vt. Hight 15—20 feet. It is often reared in shrubberies, chiefly for its large corymbs of white flowers, and its handsome bunches of fulvous berries which succeed. It has smooth, pinnate leaves, each of 4 pairs of leaflets. Corymbs terminal. May. *Mountain Ash.*

2. P. ARBUTIFO'LIA. *L.* Aronia arbutifolia. *Pers.*

Leaves ovate, acuminate, serrate, downy beneath; *flowers* in corymbs. A shrub 2—4 feet high, in thickets, &c. Leaves oval or obovate, crenulate-serrate. Flowers white. Filaments white. Anthers crimson. Peduncles and calyx downy. Fruit red, sweet, but astringent to the taste.

β. melanocarpa; leaves obtuse, and with the calyx smooth; *fruit* black. Mountains. May. Jn.

3. P. CORONA'RIA.

Leaves broad-oval, rounded at base, on very slender stalks, cut-serrate, often lobed or angled, smooth, as well as the pedicels; *styles* united and wooly at the base; *flowers* corymbose, and with the fruit very fragrant. This is a shrub or small tree, 10—20 feet high, found native in the western parts of N. York, &c. in woods and hedges, and is sometimes cultivated. The flowers which appear in May, are pale rose-colored, very large and sweet-scented. The fruit is as large as a small apple, yellowish, hard and sour. *Crab-apple.*

4. P. MALUS.

Umbel sessile, ovate, oblong, acuminate, serrate, smooth; *claws* of the petals shorter than the calyx; *styles* smooth. The apple is the most hardy, the most valuable, and the most popular of all our fruits. No other is cultivated with so little trouble, or brought to so high a degree of perfection in our climate. The Romans had 22 varieties, but this number has now been increased to several hundred, and new varieties are still produced in nearly every nursery; reared from the seed. The flowers appear in May, and by their beauty, fragrance and profusion, make ample amends for the roughness and deformity of the tree. The apple-tree is a native of many parts of Europe. *Apple-tree.*

5. P. COMMU'NIS.

Leaves ovate, serrate; *peduncles* corymbose. If the Apple be esteemed first among fruits, the Pear must have the second rank. It is far superior, indeed, in the richness and delicacy of its taste, but less valuable for most culinary purposes, and is liable to more speedy decay. The Romans had 36 varieties of the Pear, but like the Apple, varieties without number are now produced from seeds. The tree is taller and more upright than the Apple, but its blossoms are white and less showy. It is grafted on young trees of the same kind, or upon the Apple or Quince. Native in Europe, where, in its wild state, the fruit is small, hard and unpalatable. May. *Pear-tree.*

6. P. CYDO'NIA. Cydonia vulgaris.

Flowers solitary; *fruit* tomentose; *leaves* ovate, entire. The Quince is native of the town of Cydon, in the island of Crete, whence the specific name. It is also a native of Austria. It is a low tree or shrub of unsightly form, but with handsome foliage and flowers, and a large pomaceous fruit, which is a well known ingredient in preserves and jellies. The tree is reared from layers in moist loam. *Quince.*

7. P. PRUNIFO'LIA.

Umbels sessile; *peduncles* pubescent; *styles* wooly at base; *leaves* ovate, acuminate. Native of Siberia. A tree 20 feet high, with numerous pink-colored flowers, and a fruit smaller than the apple, esteemed for preserves and tarts, and when mellowed by frosts, is not unpleasant to eat in the raw state. May. *Siberian Crab.*

6. AMELA'NCHIER.

Calyx 5-cleft; petals oblong-obovate or oblanceolate; stamens short; styles 5, united; pome 3—5-celled; cells partially divided, 2-seeded.

Small trees or shrubs.

A. CANADEN'SIS. *T. & G.* Pyrus Botryapium. *L.* Mespilus arborea. *Mx.*

Leaves oval or eordate, acuminate or mucronate, sharply serrate, smooth; *flowers* in racemes; *petals* linear, oblanceolate; *segments* of the calyx about as long as the tube; *fruit* purplish, globose. A tree found in woods, rarely exceeding 35 feet in hight. Leaves alternate, 2—3 inches long, downy-tomentose when young, at length very smooth on both sides, very acute and finely serrate. Flowers large, white, in terminal racemes, appearing in April and May, rendering the tree quite conspicuous in the yet naked forest. Fruit pleasant to the taste, ripening in June. *Shad Berry. June Berry.*

β. *rotundifolia;* (Pyrus ovalis, *W.*) *leaves* broad-oval; *petals* linear-oblong. Shrub 10—20 feet high. Woods, common. Apr. May.

γ. *oligocarpa;* (Aronia sanguinea, N.) *leaves* narrow, oval or oblong, finely serrate, smooth even when young; *racemes* few-flowered. Shrub. Apr. May.

SUBORDER III. ROSACEÆ *proper.*

Ovaries solitary or several, distinct. Fruit achenia or follicular.

7. ROSA.

Calyx urceolate, fleshy, contracted at the orifice, 5-cleft; petals 5; achenia numerous, bristly, fixed to the inner side of the calyx.

Celtic, *rhos,* red; Gr. ῥόδον; Lat. *Rosa;* Eng. *Rose.* Justly styled the queen of flowers, for, from time immemorial, it has been the choice and favorite flower of civilized man. Cal. inferior, with a pitcher-shaped tube, perm., deeply divided into 5 lanceolate segments, either all simple or 2 of them only, the other 3 being appendaged. Pet. obeordate, 5, but greatly increased by culture. Fil. filiform. Ova. numerous, with silky hairs. Fruit round or ovate, formed of the matured and colored calyx, tube closed and containing the achenia.

1. R. RUBIGINO'SA.

Fruit obovate; *peduncles* and *petioles* glandular-hispid; *stem* smooth; *prickles* recurved; *leaflets* oval, with ferruginous glands beneath. A slender shrub, 3 or 4 feet high, in pastures, about hedges, &c. The stem is bushy, much branched, with numerous, strong, hooked prickles; the younger shoots nearly simple, declined at top. Leaves pinnate, of 5—7 leaflets, doubly serrate, bright green above, clothed with viscid, reddish glands beneath, which, when rubbed, yield a delightful fragrance. Flowers red, sweet-scented. Fruit scarlet, smooth or bristly. Jn. *Eglantine. Sweet-briar.*

β. *microcantha. Fruit* ovate, and with the peduncles somewhat hispid; *prickles* recurved; *leaflets* ovate, acute. Habit like the preceding, but larger and more common. Stems often 6 feet high. Leaves rusty and glandular beneath, but less fragrant than the last. Flowers scarcely half as large, nearly white, appearing in June. *Small-flowered Sweet-briar.*

2. R. LU'CIDA.

Fruit depressed-globose, and, with the *peduncles*, glandular-hispid; *petioles* pubescent or hispid; *stem* armed with scattered, setaceous prickles, those of the stipules straight; *leaflets* elliptical-lanceolate, simply serrate, smooth and shining; *flowers* generally in pairs. A shrub, 8 feet high, in woods and hedges. Stem slender. Leaflets about 5. Flowers large, red. Jn. Jl. Variable. *Wild Rose.*

3. R. CAROLI'NA.

Fruit globose, hispid, as well as the peduncles; *petioles* hairy, sub-aculeate; *stem* smooth, with uncinate, stipular prickles; *leaflets* 5—7, oblong-lanceolate, acute, sharply serrate, glaucous beneath; *flowers* in corymbs. A shrub in swamps and wet woods, varying in hight from 4 to 8 feet. It is erect, bushy, varying in the number and size of the prickles, with reddish twigs and branches. Flowers in a sort of corymb of 5 to 7. Petals obovate, varying between red and white. Jn. Jl. *Swamp Rose.*

4. R. BLANDA. *Ait.* R. gemella. *L.*

Fruit globose, smooth, as well as the peduncles; *flowers* mostly in pairs; *leaflets* oblong, acute, opaque; *petioles* and *veins* pubescent beneath; *prickles* uncinate, those of the stem in pairs below the axils. A low shrub, with large red flowers, on dry, sunny hills. Leaflets 7, rather downy and glaucous beneath. Flowers terminal, enveloped in large, downy bractea. Jl. Aug. *Twin-flowered Rose.*

5. R. CINNAMO'MEA.

Fruit globose; *stem* tall, cinerous, with upright branches; *prickles* stipular, straight; *stipules* wavy; *leaflets* rugose, oblong, downy beneath. Native of Oregon. An early species, flowering in May. Stem 6 feet high. The double variety has flowers of a delicate purplish color. *Cinnamon Rose.*

6. R. GA'LLICA.

Fruit ovate, and with the peduncles, hispid; *stems* and *petioles* hispid-prickly; *leaflets* 5, rigid, elliptical; *flowers* erect, red; *sepals* ovate. Native of the southern parts of Europe. This is the common red rose of our gardens, from which tinctures and preserves are often extracted, and which is also used medicinally. Of this species, no less than 200 varieties are produced in the gardens of Europe, and named in the catalogues of the London and Paris nurserymen. Stems 2—3 feet high, armed with five scattered prickles. Flowers of a few large, spreading petals, of a rich crimson color except at the base, where like the stamens, they are of a golden yellow. The more common varieties are the *cardinal*, *carmine*, *coquette*, *black-damask*, *mignonne*, *purple*, *velvet*, *&c.* *Common or French Rose.*

7. R. DAMASCE'NA.

Arms unequal, the larger ones falcate; *sepals* reflexed; *fruit* long. From Levant. This species forms a bush 3 or 4 feet high. The leaves are distinguished at sight, by their hoary and downy aspect. The prickles of the stem are broad and hooked. The flowers are rather numerous, of a delicate, purplish pink, of a sweet and most delicious fragrance. Varieties numerous, among which the monthly is the most admired. This is of humble growth, with deep crimson flowers, blooming at all seasons of the year. *Damask Rose.*

8. R. SPINOSIS'SIMA.

Arms unequal; *leaflets* flat, naked, simply-serrate. Native of Europe. A shrub 2 or 3 feet high. Stem closely beset with innumerable, straight, needle-

like prickles. Leaflets 7—9, roundish, obtuse. Flowers with a pleasant fragrance, usually cream-colored, but changing in the numerous varieties, to shades of red, white and yellow. *Burnet or Scotch Rose.*

9. R. LU'TEA.

Prickles straight; *leaflets* flat, concave; *calyx* nearly naked, entire. Native of Germany. Stems with numerous prickles. Leaves dark green, shining, with smallish leaflets. Petals large, broad-obcordate, of a golden yellow. Grows about 3 feet high. Flowers of a less agreeable odor than the leaves. *Yellow Rose.*

10. R. CANI'NA.

Stem and *petioles* prickly; *leaves* ovate, smooth; *fruit* and *peduncles* smooth. This species of the Rose is inferior to none in elegance or fragrance. Native of Europe. Shrub 6—8 feet high. Leaflets usually 7, of a dark, shining green above, paler beneath. Flowers pink-colored. Jn. *Dog-Rose.*

11. R. MUSCO'SA.

Calyx and *peduncles* mossy; *branches* and *petioles* hispid and viscid; *leaflets* glandular-ciliate. The Moss Rose is the very emblem of beauty and loveliness. The color of the flower is usually that peculiar crimson blush, called rose-color, and its fragrance delightful. Shrub 3 feet high. Native of Europe. Jn. Jl. *Moss Rose.*

12. R. MASCA'TA.

Branchlets nearly naked; *leaflets* elliptical, acuminate, glaucous beneath, with connivent serratures; *panicles* many-flowered, and with the *calyx* downy. Barbary. Its stems are trailing or climbing, some 10 or 12 feet long, smooth, with scattered prickles. Flowers rather large, numerous, white, in terminal panicles, very fragrant. *Musk Rose.*

13. R. CENTIFO'LIA.

Arms unequal, the larger ones falcate; *leaflets* glandular-ciliate; *flowers* nodding; *calyx* viscid; *fruit* oblong. S. Europe. Shrub 3 feet high, very prickly. Flower usually of a pink-color, but varying in hue, form, size, &c. through near a hundred varieties, described and named in European catalogues. *Hundred-leaved or Provens Rose.*

14. R. MULTIFLO'RA.

Branchlets, *peduncles* and *calyx* downy; *leaflets* lanceolate, soft, rugose; *stipules* pectinate. Japan. A shrub of luxuriant growth, easily trained to the hight of a dozen feet. Flowers numerous, in clusters, with numerous, imbricated pink petals. *Japan Rose.*

15. R. SEMPERVI'RENS.

Root shoots climbing; *prickles* nearly equal, falcate; *leaves* evergreen. From S. Europe. A shrub, of rapid and luxuriant growth, trailing or climbing 20 feet, in favorable circumstances. Leaves shining, evergreen. Flowers white. *Evergreen Rose.*

β. subdecidua, with leaves somewhat deciduous.

16. R. AL'BA.

Leaflets oblong, glaucous, simply serrate; *sepals* reflexed; *fruit* unarmed. Germany. Shrub 5—6 feet high. Flowers large, corymbose, sweet-scented,

usually of a pure white, but often, in the numerous varieties, tinged with the most delicate blush. *White Garden Rose.*

17. R. BURGUNDI'ACA.

Dwarf; *arms* nearly equal; *leaflets* rigid, ovate, acute, finely serrate; *sepals* ovate. Europe. Shrub a foot high, well known for its diminutive flowers, which are about an inch in diameter, often less, of a purple hue, fragrant. *Burgundy Rose.*

18. R. I'NDICA.

Leaflets elliptical, acuminate, smooth, crenate, serrate, glaucous beneath; *ovaries* 40—50. East Indies. A shrub of lofty growth. Stem 15—20 feet high, armed with scattered, strong, sharp, hooked prickles. Leaves of a deep, shining green above, paler beneath, of about 5 leaflets. Flowers common size, flesh-color, but varying in the numerous varieties, through every tint of pink and carnation. Calyx leafy, pinnate or jagged. *Blush Chinese Rose.*

19. R. PENDULI'NA.

Unarmed; *fruit* long, pendulous; *peduncles* hispid; *leaflets* numerous; *stem* colored. Native at the South. Stem 5—6 feet high, smooth, dark, red, bushy, and has the peculiar distinction of being without a thorn. Leaflets 9—13, elliptical, large, smooth. Flowers crimson or purple. *Thornless Rose.*

This beautiful genus includes, according to Professor Lindley, about 100 species; but the varieties produced by cultivation amount to near a thousand. These are obtained from the seed, and their number is annually increasing. The usual mode of propagation is by layers.

8. RUBUS.

Calyx spreading, 5-parted; petals 5, deciduous; stamens numerous, inserted into the border of the disk; ovaries many, 2-ovuled, one of them abortive; achenia pulpy, drupaceous, aggregated into a compound berry.

Celtic *rub*, red, the color of the fruit of some of the species.—Perennial, half shrubby plants, with biennial stems, usually with prickles. Inflorescence centrifugal. Fruit eatable.

* *Blackberries.*

Fruit inseparable from the juicy, deciduous receptacle.

1. R. VILLO'SUS.

Pubescent, viscid and prickly; *stem* angular; *leaflets* in 3s or 5s, ovate, acuminate, serrate, hairy on both sides; *stem* and *petioles* prickly; *calyx* short, acuminate; *racemes* loose, naked, about 20-flowered. A tall, branching, thorny shrub, 4—6 feet high, in pastures and hedges, well known for its delicious fruit. Stem furrowed, armed with sharp prickles. Leaflets rather large, with scattered hairs above, and a soft pubescence beneath. The terminal one has a long foot-stalk, the others very short. Pedicels slender, flowers white, in an erect raceme. Fruit a compounded berry, of a shining black, ripe in Aug. and Sept., abundant and very sweet. Few persons, in the interior of N. England, are unacquainted with the pastime of gathering blackberries in their native wilds and thickets. Jn. *High Blackberry.*

β. frondosus; stem prickly, erect; *leaves* ternate and quinate; *pubescence* simple; *racemes* leafy, about 10-flowered. Road sides, thickets, &c. Petals orbicular-ovate, approximate, white, those of the terminal flowers opening first. Fruit black, sweet.

2. R. HIS'PIDUS.

Stems slender, reclining or prostrate, hispid with bristles; *leaves* 3-foliate, rarely quinate, smooth and green both sides, the leaflets coarsely serrate, somewhat obtuse and subcoreaceous; *peduncles* naked, many-flowered, corymbose; *fruit* and *flowers* small. In damp woods Enfield, N. H., &c. Stems woody, reclining above, thickly covered with deflexed bristles. Leaves commonly ternate, on long stalks; leaflets lanceolate, with irregular serratures, the upper one petiolate. Flowers white. Fruit dusky purple. *Bristly Blackberry.*

β. semperv'rens; stem trailing, several feet in length, sending up many branches, which are some 8 inches long, and with scattered prickles like the stem. Leaves alternate, obovate, and, like the above, persistent, but becoming somewhat discolored before spring. Berries small, black, acid. Jl.

3. R. CANADE'NSIS. *L.* R. trivialis. *P.*

Stems procumbent; *leaves* ternate or quinate, oval, acute, unequally serrate; *pedicels* solitary, elongated; *peduncles* and *petioles* rough with recurved prickles. Common in dry, stony fields. Stem slender, weak, prostrate, running several yards upon the ground. Flowers large, mostly solitary, on long, slender stalks. Petals white, obovate. Fruit large, black, agreeable. May. June. *Trailing Blackberry. Dew-berry.*

4. R. CUNEIFO'LIUS.

Stem erect, subangular; *branches, petioles* and *peduncles* pubescent; *leaflets* cuneate-obovate, in 3s or 5s, entire at base, toothed above, subplicate, downy beneath; *racemes* loose. Dry fields and thickets. A low shrub, bearing fruit of an agreeable flavor, ovate, black. Jn. *Wedge-leaved Blackberry.*

* * *Raspberries.*

Fruit concave beneath, separating from the dry, conical, persistent receptacle.

5. R. ODORA'TUS.

Leaves simple, palmate, with 3—5 lobes; *stem* unarmed, many-leaved, many-flowered, covered with a viscid pubescence. A fine flowering shrub, 3—5 feet high, common in upland woods in N. H., Vt, &c. It is cultivated in gardens, both in this country and Europe, much admired for its numerous, large, crimson flowers, and its ample foliage. Leaves very large, serrate, roughish, mostly in 5 lobes, with hairy stalks. Flowers large, purple, not much unlike a rose, save its stamens are white. Fruit broad, thin, yellowish, and agreeable to the taste. A variety has red fruit. This plant is sometimes called Mulberry. Jn. Jl. *Flowering Raspberry.*

6. R. STRIGO'SUS.

Unarmed, strongly hispid; *leaflets* 3 or 5, oval, obtuse at base, marked with lines and whitish downy beneath, the odd one often subcordate. A common, erect shrub, in hedges, neglected fields, &c. bearing a very delicate fruit. Stem without prickles, but covered with bristles instead. Leaves ternate or 5-pinnate, only the terminal one stalked. Fruit a compound berry, red, of a peculiar, rich flavor, ripe in July. Flowers white, in terminal clusters. May. *Wild Red Raspberry.*

7. R. OCCIDENTA'LIS.

Branches and *peticles* glaucous and prickly; *leaves* ternate; *leaflets* ovate, acuminate, sublobate, doubly serrate, downy beneath; *petioles* terete. A tall, prickly shrub, 5 feet high, common in rocky fields, thickets, &c. Stem round, slender, inclining, conspicuous for its fine glaucous dust. Leaflets oval, covered beneath with a whitish down, only the terminal one stalked. Fruit a black, round, compound berry, of a lively, agreeable taste, ripe in July. Flowers white, in terminal racemes. May. *Black Raspberry. Thimble-berry.*

8. R. TRIFLO'RUS. *Rich.* R. saxatias. *Bw.*

Herbaceous, pubescent; *stems* creeping; *leaves* ternate; *leaflets* rhombic, acute, cut-dentate, naked, the odd one stalked; *flowers* somewhat in 3s, with elongated pedicels. Mountains. Root perennial, but the stems are annual and somewhat herbaceous. Fruit small, black. Flowers white. Jn. *Three-flowered Raspberry.*

9. R. CHAMÆMO'RUS.

Herbaceous; *stem* decumbent at base, erect, unarmed, 1-flowered; *leaves* simple, cordate-reniform, rugose, with 5 rounded lobes, serrate; *sepals* obtuse. An Alpine species of small size, but with large flowers and fruit. Petals white, obovate. Berries red, richly flavored. Flowers in June, July, ripening the fruit in September. *Cloud-berry.*

10. R. IDÆ'US.

Leaves 5-pinnate and ternate; *leaflets* rhomb-ovate, downy beneath; *petioles* channelled; *stem* prickly-hispid; *flowers* somewhat panicled. Native of stony woods and thickets, and successfully cultivated in our gardens. An erect, shrubby plant, about 5 feet high. Stem usually covered with bristly thorns, but sometimes quite smooth. Leaflets nearly smooth above, covered with a dense, cotton-like down beneath. Flowers in lax, terminal clusters, white. Fruit dark red, compound berries, highly and richly flavored. In the variety *Americanus*, the leaves are all ternate. *Garden Raspberry.*

9. POTENTI'LLA.

Calyx concave, deeply 4—5-cleft, with an equal number of alternate, exterior segments; petals 4—5, obcordate; stamens numerous; filaments slender; ovaries collected into a head on the small, juiceless receptacle.

Lat. *potentia*, power; in allusion to its supposed potency in medicine. Seeds naked, rugose, attached to a small, dry receptacle. Herbs, with pinnately or palmately compound leaves. Flowers solitary or in cymes, yellow or white.

* Leaves trifoliate.

1. P. NORVE'GICA.

Leaves 3-foliate; *stem* dichotomous above, erect; *peduncles* axillary. A hairy plant found in old fields. Stem about 8 inches high, round, forked at top Leaflets stalked, oval, cut-serrate. Stipules large, ovate. Flowers numerous, crowded, axillary and terminal. Petals obovate, shorter than calyx, yellow. July. Per. *Norway Cinquefoil.*

2. P. TRIDE'NTATA.

Leaves evergreen; *leaflets* cuneate, 3-toothed at the end; *flowers* terminal, corymbose; *petals* longer than the calyx. On the White Mountains, &c. The root and lower part of the stem woody. Stems erect, round, panicled, hairy, 4—8 inches high. Leaflets sessile, leathery, oblong, ending in 3 large teeth. Flowers few, in a sort of corymb. Petals obovate, white. June. Per. *Mountain Potentilla.*

* * Leaves digitate.

3. P. CANADE'NSIS.

Villose-pubescent; *stems* sarmentose, procumbent, and ascending; *leaves* palmately 5-foliate, the leaflets obovate, silky beneath, cut-dentate towards the apex, entire and alternate towards the base; *stipules* hairy, deeply 2 or 3-cleft, or entire; *pedicels* axillary, solitary; *bracteoles* of the calyx longer than the segments, and nearly as long as the petals. Common in fields and thickets. Stems more or less procumbent at base, from a few inches to a foot or more in length. Flowers yellow, on long pedicels. Calyx segments lanceolate or linear. Apr. May. *Common Cinquefoil.*

α. sarmentosa. Very small and delicate. Stems procumbent, running a foot or more. Flowers small, low among the grass, on slender peduncles. *Running Cinquefoil.*

β. simplex. Stem simple, erect or ascending at base. Plant nearly smooth. Leaflets oblong-oval, coarsely serrate.

4. P. ARGE'NTEA.

Leaves quinate; *leaflets* cuneate, cut, revolute on the margin, white and downy beneath; *stem* ascending. A small species frequent in fields, remarkable for the silvery canescence on the under side of the leaves. Stem half a foot high, white and cottony, half-erect, spreading. Flowers numerous, in corymbose, terminal panicles, small, yellow. Jn.—Sept. Per. *Silvery Cinquefoil.*

5. P. FRUTICO'SA. P. floribunda.

Stem fruticose, hairy, erect, branching; *leaves* pinnate; *leaflets* oblong-linear, revolute, entire; *petals* longer than the calyx. A shrubby plant, 1—2 feet high, found in bogs and low grounds. Stem very branching. Leaves alternate, on slender stalks, and consisting of 5—7, oblong, very entire leaflets. Flowers yellow, in crowded, terminal corymbs. Jn. Per. *Bushy Cinquefoil.*

6. P. ANSERI'NA.

Leaves interruptedly pinnate, serrate, silky; *stem* slender, creeping and rooting; *peduncles* axillary, solitary, 1-flowered. A handsome, creeping plant, with much silvery foliage and large golden flowers, in wet meadows. Stems long, hairy, reddish. Leaves composed of 7—19 pairs of leaflets, the alternate ones smaller, covered beneath with white, silvery hairs. Flowers yellow, on long stalks. Jn. Per. *Silver-weed. Goose-grass.*

7. P. ARGU'TA. *P.* Bootia sylvestris. *B.*

Stem erect; *radical leaves* pinnate, on long petioles, hairy and pubescent; *cauline ones* few; *leaflets* broadly-ovate, cut-serrate; *flowers* in small, terminal, nearly sessile cymes. Along streams, &c. Stems 2—3 feet high, large, round, striate, and with the rest of the plant very pubescent. The upper leaves are simple and 3-foliate; lower ones 5—9-foliate. Peduncles dichotomous, with dense clusters of white flowers. Disk glandular, 5-lobed, stellate. May. June. *False Avens.*

10. COMA'RUM.

Calyx flat, deeply 5-cleft, with bracteoles alternating with the segments; petals 5, very small; stamens numerous, inserted into the disk; achenia smooth, crowded upon the enlarged, ovate, spongy, persistent receptacle.

Gr. κομαρος, the strawberry tree, which this plant resembles.—A perennial herb, creeping at base.

C. PALUS'TRE.

Leaves pinnate, of 3, 5 and 7 leaflets; *stipules* sheathing, adhering to the petiole; *flowers* somewhat panicled, every part permanent. A plant in some respects similar to the strawberry, about 1½ feet high, growing in bogs and ponds. Root creeping. Stem round, smooth, leafy, decumbent at base. Leaves on long stalks; leaflets on short ones, oblong, serrate, hoary beneath. Flower dark purple in all its parts. Fruit permanent. Jn.

Marsh Cinquefoil.

11. FRAGA'RIA.

Calyx 10-cleft, 5 alternate segments or bracteoles external; achenia smooth, naked, affixed to a large, pulpy, deciduous receptacle. Stamens numerous.

Lat. *fragrans*, fragrant; on account of its perfumed fruit.—Perennial herbs. Stems stoloniferous.

1. F. VIRGINIA'NA. *Eh.* F. Canadensis. *Mx.*

Leaves trifoliate; *leaflets* broad-oval, smoothish above; *calyx* of the fruit erect, spreading; *achenia* imbedded in pits in the globose receptacle. The fruit of the strawberry is universally grateful and salutary either alone, or with cream, sugar, or preserved. In sunny situations, the fruit is inferior to none in sweetness, but when grown in the shade it degenerates, becoming insipid and even sour. May. Ripe in Jn.—Aug. *Common wild Strawberry.*

2. F. VESCA.

Leaves trifoliate; *calyx* of the fruit reflexed or much spreading; *receptacle* conical in fruit, without pits; *peduncles* longer than leaf-stalks. Native of our woods and meadows, and well known in our gardens, where the fruit is sometimes an ounce or more in weight. Flowers white, appearing in early spring.

Garden Strawberry. English Strawberry.

3. F. GRANDIFLO'RA.

Calyx of fruit erect; *pubescence* of petioles and peduncles erect; *leaves* coriaceous, smoothish above. From Surinam, S. A. Flowers large, in early spring. Fruit very large, globose. In cultivation, the strawberry requires an open situation, and a rich, loamy soil; and the luxuriance of its foliage and flowers requires also copious supplies of water. *Pine-apple Strawberry.*

12. DALIBA'RDA.

Calyx inferior, deeply 5—6-parted, spreading, 3 of the segments larger; petals 5; stamens numerous; styles 5—8, long, deciduous; fruit achenia, dry or somewhat drupaceous.

Named for Dalibard, a French botanist.—Small, perennial herbs.

D. REPENS. D. violæoides. *M.*

Pubescent, bearing creeping shoots; *leaves* simple, roundish-cordate, crenate; *peduncles* 1-flowered. A little, creeping, diffuse plant, found in woods and mountains. Leaves obtuse, on long, slender petioles. Peduncles as long, bearing a single white flower. Jn. *False Violet.*

13. WALDSTEI'NIA.

Calyx 5-cleft, with 5 alternate bracteoles; petals 5, deciduous; stamens numerous, inserted into the calyx; styles 2—5; achenia few, dry, on a dry receptacle.

Named by Wildenow, in honor of Franz de Waldstein, a distinguished German botanist. Acaulescent perennial herbs, with radical, lobed or divided leaves and yellow flowers.

W. FRAGARIOI'DES.

Leaves trifoliate, on long, radical petioles; *leaflets* cuneate, incisely crenate-dentate, ciliate; *scapes* bracted, many-flowered; *tube* of calyx obconic. A handsome plant, found in hilly woods, N. H., bearing some resemblance to the strawberry, a few inches to half a foot high. Leaflets roundish, cut into lobes and teeth, sessile, in 3s, of a dark, shining green. Scape divided at top into a panicle of yellow flowers, on pedicels bracted at base. Jn. *Dry Strawberry.*

14. GEUM.

Calyx inferior, 5-cleft, with 5 alternate segments or bracteoles smaller and exterior; petals 5; achenia tipped with the permanent style, which is mostly jointed, bearded and geniculate.

Gr. γευω, to taste well; in allusion to the quality of the root. Cal. segments deep, acute, the 5 alternate ones smaller. Pet. rounded, cleft or entire, as long as the cal. and longer than the fil. Ova. numerous as the styles, flat, ovate, in a roundish head. Recep. columnar.—Perennial herbs.

1. G. STRIC'TUM.

Hairy, radical; *leaves* interruptedly pinnate, cauline ones 3—5-foliate; *leaflets* ovate, dentate, the terminal one larger; *stipules* erect; *calyx* with the 5 alternate bracteoles short, linear; *petals* roundish, a little longer than the calyx; *awns* naked, hooked. Habit various. Stem about 2 feet high, with a cluster of large, yellow flowers at top, on short pedicels. Petals about the length of the long calyx segments. Jl. Aug. *Yellow Avens.*

2. G. RIVA'LE.

Pubescent; *stem* simple; *radical leaves* lyrate; *stipules ovate*, acute, cut; *flowers* nodding; *petals* as long as the calyx; *awns* plumose, nearly naked at top, hooked. A fine plant, conspicuous above the grass in wet meadows, for its dark colored, nodding flowers. Stem 1—2 feet high, from a creeping, woody rhizoma. Root leaves interruptedly pinnate, inclining to lyrate, the terminal leaflets large, roundish, lobate and crenate; stem leaves ternate or trilobate, sessile. The stem divides at top into several drooping flower-stalks, forming a sort of panicle. Calyx purplish brown, closed. Petals obcordate, erect, yellowish brown, veined. The root is aromatic and astringent. June. Per. *Water Avens.*

3. G. VIRGINIA'NUM.

Pubescent; *radical leaves* pinnate, cauline ones 3—5-foliate or lobed, all unequally serrate, cut; *flowers* erect; *petals* not exceeding the calyx. About 2 feet high in hedges and thickets. Stem erect, branching. The lower leaves are sometimes ternate, or even simple, with appendaged petioles. Stipules large, cut into lobes and teeth. Flowers small, whitish. Styles bent and hairy at the summit. July. *White Avens.*

4. G. TRIFLO'RUM.

Hairy; *stem* erect, about 3-flowered; *leaves* mostly radical, interruptedly pinnate, of numerous, cuneate leaflets, cut-dentate; *bracteoles* linear, longer than the segments; *styles* plumose, very long. On the White Mts; in N.Y., &c. Stems scarcely a foot high, with a pair of opposite leaves in the middle, and several bracts at the bases of the long, slender pedicels. At the top it divides into about 3 flower-stalks, each bearing a single, large, purplish flower. June. *Three-flowered Geum.*

5. G. PECK'II.

Scape nearly naked, paniculate above, many-flowered; *radical leaves* lyrate-pinnate, the terminal leaflet very large, roundish, somewhat lobed, cut-dentate or crenate, the lateral ones minute; *petals* much longer than the calyx. White Mts. A species remarkable for its large root-leaves, which are on long, appendaged petioles, roundish-reniform, somewhat truncate at base, and with radiate veins. Petals yellow, rather large. Jl. *Peck's Geum.*

6. G. URBA'NUM.

Flowers erect; *awns* hooked, naked; *cauline leaves* ternate; *radical ones* lyrate-pinnate, in 5s; *upper leaves* ovate; *stipules* large, roundish. From Europe. The root is mildly astringent, aromatic like cloves. They are chewed to correct a foul breath.—Flowers yellow. Jn—Aug. Per. *Common Avens.*

15. SANGUISO'RBA.

Calyx tubular, 4-sided, limb 4-parted, 2—3-bracted at base; petals 0; stamens 4, opposite the calyx segments; filaments dilated upwards; style 1, filiform; achenium dry, included in the calyx.

Lat. *sanguis, sorbere*, q. d. to absorb blood. The plant has the reputation of an excellent vulnerary.—Perennial herbs.

S. CANADE'NSIS.

Spikes very long, cylindric; *stamens* many times longer than the calyx. Stem herbaceous, 2—3 feet high, smooth, striate. Leaves unequally pinnate. Leaflets oblong, obtuse, serrate. Flowers reddish-white, in long, terminal spikes, appearing in July. Native in wet grounds, and cultivated. *Canada Burnet.*

16. AGRIMO'NIA.

Calyx 5-toothed, contracted at the throat, and with hooked bristles above; petals 5; stamens 12—15; achenia 2, in the bottom of the calyx tube.

Gr. αγρος, field, and μονος, alone; a name of dignity, on account of its reputed excellence in medicine. Cal. inferior, tubular. Pet. flat, emarginate.

Fil. shorter than cor., inserted in the throat of cal. Ova. ovate, flattened, in the bottom of the cal. Styles lateral, as long as the stamens.

A. EUPATO'RIA.

Stem-leaves pinnate, the odd one petiolate; *fruit* hispid. This plant is common by road-sides, margins of fields, &c. Stem angular, hairy, 2 feet high. Leaves interruptedly pinnate, the leaflets ovate, acutely toothed, smoothish, sessile, the terminal one stalked. Flowers yellow, scattered in a long, slender spike. Calyx half as long as the petals, persistent, hispid, with hooked bristles. The plant is bitter, aromatic, astringent and tonic. In June and July, when in flower, it dyes wool a nankeen color; in September, a darker hue. Per. *Agrimony.*

β. parviflora. Stem-leaves pinnate, the odd one sessile; *fruit* hispid. Fields. Stem 2 feet high. Leaflets mostly linear-lanceolate, serrate. Petals once and a half the length of the calyx. Flowers small, yellow. Jl. Per.

17. POTE'RIUM.

Flowers monœcious. *Sterile*,—calyx of 4 leaves; corolla 4-parted; stamens 30—40. *Fertile*,—calyx of 4 leaves; corolla 4-parted; ovaries 2; fruit 2-celled, invested with the calyx.

Literally a drinking vessel, and hence a beverage; the plant is used as ingredient in some medicinal drinks.

P. SANGUISO'RBA.

Unarmed; *stem* subangular; *stamens* much longer than the calyx. From Europe. The Burnet is less valued in medicine than formerly. The leaves, when bruised, smell like cucumbers, and are used as a salad. Jn. Per. *Burnet.*

18. SPIRÆ'A.

Calyx inferior, 5-cleft; petals 5; stamens 10—50, exsert; carpels distinct, follicular, 1-celled, 2-valved, 1—3-seeded.

Gr. σπειρου, a coil or wreath; in allusion to the spire-like form of the clusters. Cal. spreading. Pet. roundish. Fil. numerous, nearly as long as cor. Caps. as many as the stig.—Unarmed shrubs or perennial herbs.

1. S. TOMENTO'SA.

Leaves lanceolate, unequally serrate, tomentose beneath; *flowers* doubly racemed. A shrubby plant about 3 feet high, very common in pastures and low grounds. The stem is woody, hard, brittle, and consequently very troublesome to the scythe of the mower. Leaves leathery, dark green above, whitish and downy beneath. Flowers small, purplish, with numerous and conspicuous stamens, forming dense, conical and terminal clusters, of some beauty. The fruit which succeeds, remains upon the dead stalks during winter, furnishing food for the snow-bird. July. Aug. *Hard-hack.*

2. S. SALICIFO'LIA. *L.* S. alba. *Mx.*

Leaves elliptical-lanceolate, serrate, smooth; *flowers* panicled. A slender shrub, 3 or 4 feet high, in meadows, &c., distinguished from the foregoing by smooth leaves and whiter, larger, thinner clusters of flowers. Stem reddish,

woody. Leaves acutely serrate, thin, smooth on both sides. Flowers white, small, in large, cylindric panicles, terminal and axillary. Jl. Aug.
Meadow-sweet.

3. S. ARU'NCUS.

Leaves 3-pinnate, membranaceous; *leaflets* oblong-lanceolate, acuminate, the terminal ones ovate-lanceolate, doubly and sharply serrate; *flowers* very numerous, small, white. A tall, branching herb, on the Cattskill Mts., &c. *Tor. & Gray.*

4. S. HYPERICIFO'LIA.

Leaves obovate, entire or toothed at the apex; *umbels* sessile. A handsome shrub, 4 or 5 feet high, cultivated in shrubberies. Leaves an inch long. Flowers abundant, white, in smooth, lateral umbels, appearing in May. In Europe, where it is common, it is called the *Italian St. John's-wort. Hard-hack.*

5. S. OPULIFO'LIA.

Leaves ovate, 3-lobed, serrate; *corymbs* stalked. River banks throughout the Northern and Middle States. A shrub 4 feet high, sometimes seen in our shrubberies. Leaves like those of the viburnum opulus. Flowers white, in crowded, terminal corymbs. Capsules inflated, smooth, of a shining brown. Styles 3. June.

19. GILLE'NIA.

Calyx infundibuliform, 5-toothed; petals 5; stamens 10—15, very short; styles 5; carpels 5, connate at base, each 2-seeded.

Gr. γελαω, to laugh; on account of its exhilarating qualities. Cal. tubular, with an expanding, 5-toothed border. Cor. partly unequal. Pet. lanceolate, tapering at the claws. Stem included. Capsule opening within.—Perennial herbs, with trifoliate leaves.

G. TRIFOLIA'TA.

Leaves trifoliate, lanceolate, serrate, nearly equal; *stipules* linear, entire; *flowers* in loose, terminal panicles; *calyx* tubular-campanulate; *styles* 5. A handsome herbaceous plant, 2 feet high, with ternate or trilobate leaves, and white flowers appearing in June. *Indian Physic.*

ORDER XLIX. LEGUMINOSÆ. *Leguminous or Bean Tribe.*

Cal.—Sepals generally 5, more or less united, often unequal.
Cor.—Petals 5, either papilionaceous or regular, perigynous.
Sta.—Diadelphous, monadelphous or distinct. *Anthers* versatile.
Ova.—Superior, single and simple. *Style* and *stigma* simple.
Fr.—A legume, either continuous (1-celled), or (a *loment*) jointed into 1-seeded cells.
Sds.—Solitary or several, destitute of albumen.

An immense family, consisting of herbs, shrubs and trees, with alternate, usually compound leaves. Stipules 2, at the swelling base of the petiole. Stipelles commonly 2, at the base of each leaflet. The Order is divided into two principal Suborders, whose characters are indicated further on; viz. Suborder I, PAPILIONACEÆ, and Suborder 2, MIMOSEÆ.

Geography. The Leguminosæ are distributed throughout all lands, with the exception of a few unimportant Islands, from the Equator to either of the frigid zones. Of its 8300 species known, about 290 are natives of the United States, 1602 (according to De Candolle) inhabit the Torrid Zone, 1302, north of that Zone, and 424, south of it.

Properties. No family of the vegetable kingdom possesses a higher claim to the attention of the naturalist than the Leguminosæ, whether we regard them as objects of ornament or utility. Of the former we might mention the splendid varieties of Cercis, with their purple flowers, the Acacias, with their airy foliage and silky stamens, the pride of India, Collutea and Cæsalpina, with a host of others, which, like the Sweet Pea, are redolent with perfume. Of the latter, the Beans, Peas, Lentils, Clover and Lucerne, are too well known to require particular commendation. Among timber trees the Rosewood (a Brazilian species of Mimosa), the Laburnum, whose wood is durable and of an olive-green color, and the Locust (Robinia) of our own country, are pre-eminent.

The following are a few of the important officinal products of this order. In medicine: *liquorice* is the product of the root of Glycyrrhiza glabra of S. Europe. The purgative *senna* consists of the leaves of Cassia senna, C. acutifolia, C. Æthiopica and other species of Egypt and Arabia. C. Marylandica is also a cathartic, but more mild than the former. The sweet pulp *tamarind*, is the product of a large and beautiful tree (Tamarindus Indica) of the E. and W. Indies. Resins and balsams: *Gum senegal* is yielded by Acacia Verek of the river Senegal; *Gum Arabic*, by several species of Acacia of central Africa; *Gum Tragacynth*, by Astragalus verus, &c. of Persia. *Balsam Copaiva* is the product of several species of Copaifera, natives of Brazil and W. India; *Balsam Tolu* of Myospermum toluiferum, of Peru, and *balsam Peru* of M. peruiferum of the same country. Dyes, &c. *Indigo*, the most valuable of all, (but a violent poison,) is the product of several southern species of Indigofera, as I. anil of the W. Indies, and I. argentea of Egypt. *Brazil-wood*, from Caesalpina Braziliensis. *Log-wood* from Haematoxylon Campeachianum, of Campeachy, and *Red-sandal-wood* from Pterocarpus santalinus of Egypt, &c. &c.

Conspectus of the Genera.

* Corolla papilionaceous.

Leaves	trifoliate				Calyx 5-toothed,	*Melilotus.* 6
			Legumes	1—2-seeded;	Calyx 4-toothed,	*Amphicarpæa.* 7
		pinnately;		many-seeded;	calyx 5-toothed,	*Phaseolus.* 5
				1-jointed, 1-seeded;	diadelphous,	*Lespedeza.* 8
				2-jointed, 1-seeded;	monadel.	*Stylosanthes.* 12
			Loment	many-jointed,		*Desmodium.* 11
					Legume falcate or spiral,	*Medicago.* 9
					Legu. short, few-seeded,	*Trifolium.* 10
		palmately;	Sta. diadelphous;		Legu. square, 4-winged,	*Tetragonolobus.* 13
			Stamens distinct, equal,			*Baptisia.* 17
					outside,	*Lathyrus.* 1
			and produced	Style villous	inside,	*Vicia, Pisum.* 2, 3
			into tendrils;	Style glabrous,		*Ervum.* 4
	pinnate	abruptly,	not cirrhose; stam. monadelphous; leaflets 4,			*Arachis.* 16
					linear, many-seeded,	*Tephrosia.* 14
			Leafl. 9—33;	Leg. flat	oblong, 1—1-seeded,	*Glycyrrhiza.* 15
					1-celled, grooved,	*Phaca.* 18
				Leg. turgid	sub-2-celled,	*Astragalus.* 19
		unequally;	Herbs;	Leaflets 5—7;	stem twining,	*Apios.* 21
					inflated,	*Collutea.* 22
			Shrubs unarmed;	Legume	terete, arcuate,	*Indigofera.* 20
				Loment jointed,		*Coronilla.* 21
			Trees, &c. armed with spiny stipules,			*Robinia.* 23
		Herbs;	stamens 10, monadelphous,			*Crotalaria.* 25
		Shrubs;	Calyx 2-leaved, with two bracteoles,			*Ulex.* 26
			Calyx 2-lipped, 5-toothed,			*Genista.* 27
	simple.	Trees;	stamens distinct; legume flat,			*Cercis.* 28

** Corolla not papilionaceous.

Leaves	bipinnate, &c. palmately 5—15-foliate; unequally pinnate, without tendrils;	Shrubs;	Fls. polygamous:		Loment 1 or more joint.	*Mimosa.* 32
					Legume not jointed,	*Acacia.* 33
			Flowers perfect;	stamens 10,		*Cæsalpina.* 31
			unarmed,			*Gymnocladus.* 34
		Trees,	spiny,			*Gleditschia.* 35
		stamens monadelphous. Herbs.				*Lupinus.* 29
		sta. 10 distinct. Herbs.				*Cassia.* 30

Tribe 1, PAPILIONACEÆ.

Corolla papilionaceous, rarely somewhat regular, imbricate or vexillary in æstivation. Stamens 10, diadelphous, rarely monadelphous or distinct, inserted with the petals into the base of the calyx.

1. LA'THYRUS.

Calyx campanulate, the two upper segments shortest; style flat, dilated above, pubescent or villous along the inside, next the free stamen.

The ancient Greek name of the Sweet Pea. Cor. 5-petaled, vex. largest, obcordate; alæ oblong, obtuse, curved upwards, approximate; keel of 2 united petals with separate claws. Style ascending, bent at a right angle with the ovary.—Herbaceous, mostly climbing. Leaflets from one pair to several. Petioles produced into tendrils. Peduncles axillary.

1. L. VENO'SUS. *Muh.*

Stem 4-cornered, naked; *stipules* semi-sagittate, lanceolate, very small; *peduncles* 8—16-flowered, shorter than the leaves; *leaflets* 5—7 pairs, somewhat alternate, obtusish, mucronate. Stem erect, 2—3 feet high. Flowers purple. In shady grounds. Jn. Jl.

2. L. OCHROLEU'CUS. *Hook.*

Stem slender; *peduncles* 7—10-flowered, shorter than the leaves; upper segments of the calyx truncate, angular; *leaflets* about 3 pairs, broadly ovate; *stipules* semi-cordate. A small, delicate species, in shady places and river banks. June. July.

3. L. PALU'STRIS.

Stem winged; *stipules* semi-sagittate, large, ovate, mucronate; *leaflets* in 3 pairs, oblong-ovate, mucronate; *peduncles* 3—5-flowered, rather larger than the leaves. A slender climber, found in wet meadows and thickets. Leaves pinnate-cirrhose, broad or narrow-ovate. Flowers variegated with purple and blue, drooping. Stems square, broadly winged at the angles, slender, supported by the tendrils. Jn. Jl. Per. *Marsh Lathyrus.*

4. L. MARI'TIMUS. *Bw.* Pisum maritimum. *P.*

Stem quadrangular, compressed; *petioles* flat above; *stipules* sagittate; *leaflets* numerous, subalternate, ovate; *peduncles* many-flowered. A pale green, creeping plant, resembling the common pea, found on sandy shores. Stem rigid, 1—2 feet in length. Stipules connate. Leaves ending in a branching tendril, the lower pairs of leaflets largest. Flowers large, blue. Pod hairy. May—July. Per. *Beach Pea.*

5. L. MYRTIFO'LIUS. *Muh.*

Stem quadrangular, winged, weak and flexuous; *stipules* semi-sagittate, ovate-lanceolate, acuminate; *leaflets* 2 pairs, oblong-lanceolate, acute, mucronate, veinless; *peduncles* longer than the leaves, 4—5-flowered. A little climber, growing on river banks. Stem about 3 feet long. Flowers red. Jl. Per.

6. L. LATIFO'LIUS.

Peduncles many-flowered; *tendrils* 2-leaved, the leaflets lanceolate; *joints* membranous-winged. A very showy plant for gardens and arbors, native of England. Stem 6 feet long, climbing, winged between the joints. Flowers pink. Jl.—Sept. Per. *Everlasting Pea.*

7. L. ODORA'TUS.

Peduncles 2-flowered; *tendrils* 2-leaved, the leaflets ovate-oblong; *legumes*

hirsute. A well known garden flower, native of Sicily. The flowers appear in June, are large, variegated with red and white. Very fragrant. Ann. *Sweet Pea.*

8. L. SATI'VUS.

Peduncles 1-flowered; *tendrils* 2—4-leaved; *pods* ovate, compressed, with two edges at the back. Native of S. Europe, where it has been sometimes cultivated for food; but it proved to be a slow poison, both to man and beast, producing ultimately entire helplessness, by rendering the limbs rigid, but without pain. Ann. *Chick Pea.*

9. L. CLY'MENUM.

Peduncles 2-flowered; *tendrils* many-leaved; *leaflets* lanceolate; *stipules* toothed. Native of Levant. Ann. *Various-flowered Pea.*

2. VI'CIA.

Calyx with 3 inferior segments, straight, and longer than the 2 above; vexillum emarginate; style transversely bearded beneath the stigma.

Celtic *gwig*, whence, Gr. βικιον, Lat. *vicia*, Fr. *vesce*, Eng. *vetch*. Cor. of 5 petals, vex. largest, oval, ascending, alæ oblong, approx., carina flattened, of 2 united petals with separate claws. Fil. 10, 4 united into a compressed tube, open at the upper edge, the others hair-like, separate. Stig. obtuse, with a tuft of hairs in front, below the summit.—Mostly climbing herbs. Leaflets several pairs. Petioles produced into branching tendrils. Peduncles axillary.

1. V. AMERICA'NA. *Mich.*

Smooth; *peduncles* 4—8-flowered, shorter than the leaves; *stipules* semi-sagittate, deeply dentate; *leaflets* 10—14, elliptic-lanceolate, obtuse, mucronate, veined, somewhat alternate; *legumes* oblong-linear, compressed, reticulated. Stems slender, 1—3 feet long. Flowers blue or purple. Lower calyx teeth broad-lanceolate, much longer than the 2 upper. Style very hairy at the summit. May. *American Vetch.*

2. V. CAROLINIA'NA. *Walt.*

Peduncles many-flowered; *flowers* distant; *teeth* of the calyx shorter than the tube, the two upper very short; *style* hairy at the summit; *leaflets* 8—12, linear-oblong, smoothish; *legumes* not reticulated, oblong. Woods and river banks. A slender climber, 4—6 feet long. Flowers pale blue, the banner tipped with deep purple. May. Per. *Carolinian Vetch.*

3. V. TETRASPE'RMA. *Loisel.* V. pusilla. *Mh.*

Peduncles about 2-flowered; *calyx* teeth lanceolate, shorter than the tube; *legume* smooth, 4-seeded; *leaflets* 4—6, small, linear; *stipules* lanceolate, semi sagittate. Slender and delicate plants, growing on banks of streams, &c. Flowers very small, bluish white. Legumes about 5-seeded. Jl. Ann. *Slender Vetch.*

4. V. SATI'VA.

Flowers 2, subsessile; *stipules* toothed, dotted; *leaflets* oblong-ovate, retuse, mucronate; *legumes* erect, roundish, smooth. A slender, climbing plant,

found in cultivated fields, probably introduced. Stem square. Leaflets in 5—6 pairs, lanceolate, the lower ones abrupt. Flowers axillary, purple. Stipules marked with a dark spot. Jn. Ann. *Common Vetch.*

5. V. CRACCA.

Flowers in imbricated spikes; *leaflets* lanceolate, pubescent; *stipules* semi-sagittate, linear-subulate, entire. A slender climber, 2—3 feet long, about fences, hedges, thickets, &c. Stem square, downy. Leaves of many pairs of downy, mucronate leaflets, with a branched tendril at the end of the principal stalk. Flowers blue and purple, arranged in a long, dense, one-sided raceme. July. Per. *Tufted Vetch.*

6. V. FABA.

Stem many-flowered, rigidly erect; *legumes* subsessile, torulose; *leaflets* oval, entire, acute; *stipules* sagittate, dentate at base. Native of Egypt. This species is one of our most valuable field or garden legumes. Among its numerous varieties, the *Magazan* is the earliest and the Windsor the largest. June. Ann. *Garden Bean. Windsor Bean.*

3. PISUM.

Calyx segments leafy, two upper ones a little shorter than the rest; vexillum with 2 protruding folds; style compressed, carinate, villous on the upper side; suture of the legume without down.

Celtic *pis* a pea. Cor. papilionaceous. Fil. 10, united into a tube open on upper edge. Leaves abruptly pinnate, ending with branching tendrils.

P. SATI'VUM.

Petioles round; *stipules* round at base, crenate; *peduncles* many-flowered. One of the most valuable of leguminous plants. It has been cultivated from time immemorial, so that its native country is unknown. It has many varieties, of which the most remarkable is *β. humile*, the dwarf pea, with an erect, bushy stem not climbing, and roundish leaflets. Jn. Ann. *Common Gard. Pea.*

4. ERVUM.

Calyx 5-parted, with acute, linear and nearly equal segments, about the length of the corolla; stigma capitate, smooth.

Celtic *erw*, tilled lands; to which this plant is a pest.—Annual herbs. Leaflets numerous. Petioles produced into tendrils.

1. E. HIRSU'TUM.

Peduncles many-flowered; *legumes* hirsute, 2-seeded; *leaflets* linear, truncate. A leguminous, creeping weed, 1—3 feet in length, found in cultivated fields. Flowers purple. June. Ann. *Creeping Vetch.*

2. E. LENS.

Peduncles 2-flowered; *seeds* compressed; *leaflets* entire. Native of oriental countries, France, &c. A legume of the highest antiquity, known and valued in Esau's time, and among eastern nations ever since. In Egypt and Syria, Lentils are parched and taken by travelers in long journies. The plant is prostrate or climbing, 1 foot in length. Flowers pale purple. May. Jn. Annual. *Lentil.*

5. PHASE'OLUS.

Keel with the stamens and style spirally twisted; legume compressed, falcate, many seeded; seeds compressed, reniform; calyx campanulate, 5-cleft, two upper segments often united.

Lat. *phaselus*, a little boat, which the pods may be said to resemble.—Herbaceous, twining or trailing. Leaflets stalked.

1. P. DIVERSIFO'LIUS.

Stem prostrate, diffuse, scabrous with recurved hairs; *leaflets* angular, 2—3-lobed or entire; *peduncles* longer than the leaf, few-flowered; lower tooth of the calyx longer than the tube; *legumes* pubescent, broadly linear, cylindric. A creeping or climbing plant, 3—5 feet long, on sandy shores. Pod becomes black when ripe, 5—7-seeded. Corolla purplish. Aug.—Oct. Ann.

2. P. HELVE'OLUS.

Stem slender, twining; *leaflets* between oblong-ovate and linear, entire; *peduncles* slender, several times longer than the leaves, few-flowered; *legume* straight, cylindric, 8—10-seeded. Grows in sandy fields. Aug. Sept.

3. P. PERE'NNIS.

Twining, pubescent; *racemes* paniculate, mostly in pairs, axillary; *leaflets* ovate, acuminate, 3-nerved; *legumes* pendulous, falcate, broad-mucronate. A slender, twining vine, several feet long, in dry woods. Panicles of flowers 6—12 inches long, exceeding the leaf, 1—3 together. Corolla red and purple. July. Per. *Bean Vine.*

4. P. VULGA'RIS.

Raceme solitary, shorter than the leaves; *peduncles* in pairs; *legumes* pendulous, long-mucronate. Native of E. Indies. Universally cultivated in the garden, not only for the sake of its matured fruit, but for its young pods, which constitute that favorite dish called *string-beans*. Varieties are produced by cultivation, in respect both to the hight of the stem and the color of the fruit. Leaves ternate, leaflets nearly smooth, broad ovate, acuminate. Stipules oblong. Flowers 4 or 6, in each cluster, their pedicels opposite, pale-bluish white. July. Ann. *Common Pole Bean.*

5. P. MULTIFLO'RUS.

Raceme solitary, as long as the leaves; *peduncles* opposite; *pods* pendulous; *bracts* appressed, a little shorter than the calyx. Native of S. America. Stem twining, many feet in length, with numerous clusters of brilliant scarlet flowers. Fruit considered less valuable for the table than the last. Jl. Ann. *Scarlet Kidney Bean.*

6. P. LUNA'TUS.

Legumes scimetar-shaped; *racemes* shorter than the leaves; *peduncles* in pairs; *seeds* compressed, purplish-white. Native of E. Indies. Stem twining, of great length. Flowers of a greenish white. Jl. Ann. *Lima Bean.*

7. P. NANUS.

Stem smooth; *bracts* larger than the calyx; *pods* pendulous, compressed, rugose. From India. Stem erect, a foot high. Flowers white. June. Ann. *Common dwarf Kidney-Bean. Buck Bean.*

6. MELILO'TUS.

Calyx tubular, 5-toothed; keel simple, shorter than the alæ and vexillum; legume rugose, longer than the calyx; flowers racemose.

Lat. *mel*, honey, and *lotus*. In drying it exhales a sweet scent. This genus was taken from *Trifolium*, from which genus it technically differs in the pods, they being longer than the calyx, and in the inflorescence being racemose, not in heads.

M. OFFICINA'LIS. *P.* Trifolium officinalis. *L.*

Stem erect; *leaflets* ovate-oblong, dentate; *legumes* naked, 2-seeded, rugose, in racemes. This kind of trefoil is about 3 feet high, growing in meadows, indigenous according to Eaton. Stem furrowed, branching. Leaves ternate, leaflets oblong, narrow, obtuse, smooth, with minute, mucronated teeth. Flowers yellow, in long, one sided, axillary, erect racemes. Pods oval, pendulous. The whole plant is sweet-scented. Jn. Ann. *Melilot Trefoil.*

β *alba*, sometimes made a distinct species, is the common *Sweet-scented clover* of the gardens. The stem is robust, very branching, 4—6 feet high. Flowers small, very numerous, white. Leaves ternate, oval, more obtuse at the summit than at the base, sharply serrate. The whole plant sweet-scented. June—Aug. Naturalized. *Sweet-scented Clover.*

7. AMPHICARPÆ'A.

Calyx tubular, campanulate, 4-toothed, (or 5-toothed, the upper 2 united) with nearly equal segments; petals oblong; vexillum with the sides appressed; stigma capitate; ovary on a sheathed stipe; legume flat, 2—4-seeded.

Gr. αμφι, around, καρπος, fruit; in reference to the ovary sheathed at base. Only the upper flowers are complete, but usually barren; those upon the lower prostrate branches, apetalous and fertile.—Slender, twining annuals.

A. MONOI'CA. *Natt.* Glycine monoica. *L.*

Leaves ternate, ovate, acute, smooth; *stem* hairy; *racemes* of the stem with pendulous, petaliferous, barren flowers; *radical peduncles* with apetalous, fertile flowers. A very slender vine, in woods and thickets. Stem twining, rough backwards. Leaves very thin. Racemes axillary, few-flowered. Flowers pale-purple. Jl. Aug. Per. *Pea Vine.*

8. LESPEDE'ZA.

Calyx 5-parted, complete, bibracteolate at base, segments nearly equal; keel of the corolla obtuse; loment lenticular, unarmed, one-seeded.

Named by Michaux, in honor of Lespedez, a governor of Florida, who protected that botanist during his researches. A genus taken from *Hedysarum*, from which it differs in the loment, which is lens-shaped, smooth, with one seed only. Perennial herbs.

1. L. CAPITA'TA. *Mx.* L. frutescens. *Ell.*

Leaves ternate; *leaflets* elliptical, obtuse, silky-pubescent; *stipules* subulate; *fascicles* of flowers ovate, sub-capitate, shorter than the leaves, axillary; *lo*

ments hairy, shorter than the villous calyx. A slender, hairy, shrubby plant, 2—4 feet high, found in dry woods. Leaves very numerous, on short petioles, each consisting of 3 mucronated leaflets, covered with silken down beneath, smooth above. Flowers white and red. Sept. *Bush Clover.*

2. L. HIRTA.

Leaves ternate; *leaflets* roundish-elliptic; *racemes* capitate, axillary, oblong, longer than the leaves; *corolla* and *loment* about as long as the calyx. A plant, 2—4 feet high, found in dry woods, erect, branching and very hairy. Leaves less numerous than the last, on very short stalks, consisting of 3 oval leaflets, hairy beneath. Peduncle hairy, much longer than the raceme. Flowers reddish white, crowded. Aug.—Sept. *Hairy Lespedeza.*

3. L. VIOLA'CEA. *Pers.*

Leaflets oval-elliptic, obtuse; *racemes* umbellate, longer than the petioles; *flowers* in pairs; *lomenta* rhomboidal, reticulate, smooth. Dry woods. Stems long and slender, nearly erect, smoothish. Leaves consisting of 3 small, mucronated leaflets, nearly smooth. Flowers violet-colored, rather numerous, pedicelled, arranged by pairs in slender racemes, which are disposed in the form of an umbel. Pods 1-seeded. Jl. Aug. *Violet Lespedeza.*

β. *sessiliflora; leaflets* oblong-oval, obtuse; *fascicles* of flowers subsessile, axillary and terminal; *loment* naked, acute; *calyx* minute. In dry woods. Stem slender, erect, branching, 2 feet high. Leaves pubescent beneath, on long stalks, consisting of 3 mucronated leaflets varying much in size. Bunches of small, violet-colored flowers numerous, the axillary ones nearly sessile. Aug.

γ. *reticulata; leaflets* oblong-linear, hairy beneath; *fascicles* of flowers subsessile, axillary and terminal; *loment* ovate, reticulate with prominent lines, acute. Dry woods. Stem simple or branched, nearly smooth. Leaflets very narrow. Flowers violet-colored.

δ. *divergens; leaflets* oblong, obtuse; *racemes* longer than the petiole; *flowers* in pairs; *legumes* ovate, reticulate, smooth. Dry woods. Plant diffuse, branching, erect, smoothish, 1 or 2 feet high. Leaflets appressed, hairy beneath, narrow, blunt at each end. Flowers violet, in long, slender, axillary racemes. Aug.

4. L. PROCU'MBENS.

Leaflets oval, upper surface smooth; *racemes* short, on very long, setaceous peduncles; *lomenta* roundish, pubescent; *stems* procumbent. Dry woods and sandy fields. Plant pubescent in all its parts. Stems several from the same root, slender, 2—3 feet long. Leaves consisting of 3 oblong or roundish leaflets, on hairy stalks. Flowers purple, in short, raceme-like heads, axillary, the lower ones apetalous, and on short, the upper on very long, thread-like filaments. Aug. *Procumbent Lespedeza.*

5. L. ANGUSTIFO'LIA.

Leaves ternate; *leaflets* oblong, oval and lanceolate, hoary-pubescent beneath; *racemes* capitate, longer than the leaves; *corolla* longer than the calyx. A tall, shrubby species, congener of L. *capitata*, found in dry woods. Stem 3—4 feet high, slender. Flowers white or reddish. Sept. *Narrow-leaved Lespedeza.*

9. MEDICA'GO.

Keel of corolla deflexed from the vexillum, by the falcate or spiral, compressed legume.

Name derived from *Medes*, its native country. Cal. inferior, straight, cylindric, in 5 nearly equal segments. Vex. ovate, entire, inflexed at the edges,

the whole reflexed. Wings oblong-ovate, affixed to the appendages of the keel, cohering by their edges within it.—Herbaceous, with palmately trifoliate leaves.

1. M. LUPULI'NA.

Spikes ovate; *legumes* reniform, 1-seeded, veiny, rugose; *stems* procumbent. Pretty common in fields and road-sides. Stems angular, leafy. Leaves ternate, resembling those of clover. Leaflets obovate, serrulate, mucronate. Spikes small, of yellow flowers. Pods somewhat spiral, a form which characterizes the genus. May—Oct. Ann. *None-such.*

2. M. SATI'VA.

Peduncles racemed; *legumes* smooth, spirally twisted; *stipules* entire; *leaflets* oblong, toothed. A deep-rooting, perennial plant, sending up numerous, tall and slender clover-like shoots, with spikes of blue or violet flowers. Native of Europe, where it is highly valued as a forage plant. It has been naturalized and cultivated to some extent with us, but has hitherto proved of less value than clover. July. Per. *Lucern Medick.*

3. M. INTERTE'XTA.

Peduncles about 2-flowered; *legumes* cochleate, oval, with downy, setaceous, pubescent, reflexed, appressed prickles; *leaflets* rhomboidal, toothed. Native of S. Europe. Cultivated as a garden flower for the curiosity of its pods. About a foot in hight. Flowers yellow. Jn.—Aug. Ann. *Hedge-hog.*

4. M. SCUTELLA'TA.

Peduncles 2-flowered; *legumes* unarmed, cochleate, orbicular, convex at the base, flat above, with concentric, spiral folds. Native of S. Europe. Cultivated among flowers for the curiosity of its pods, which much resemble snail shells. July. Ann. *Snail.*

Several other species are equally curious with the above, and are sometimes found in our gardens.

10. TRIFO'LIUM.

Legume covered by the calyx, falling off entire, 2—4-seeded; flowers subcapitate.

Gr. τριφυλλον. Fr. *trifle*, Eng. *trefoil.* As the name indicates, these plants are trifoliate. Cal. inferior, 5-toothed, perennial. Cor. 4-petaled, all more or less united by their long claws, withering. Vex. reflexed. Wings all oblong, shorter than the vex. Keel 1-petaled, shorter than the wings. Fil. 9 in one set, 1 in the other. Legumes short, membranous, without valves, hardly longer than the calyx. Seeds roundish.—Herbs. Leaflets with straight veins, scarcely reticulated. Flowers in dense heads or spikes.

1. T. PRATE'NSE.

Spikes dense; *stems* ascending; *corollas* unequal; *lower tooth* of the calyx longer than the four others, which are equal; *leaflets* oval, entire. This is the common Red Clover, so extensively cultivated in grass lands, with herds grass (*Phleum* pratense) and other grasses, and often alone. Stems several from the same root, hairy. Leaves ternate, the leaflets ovate, lighter colored in the centre, entire and nearly smooth. Stipules ovate, mucronate. Flowers red, in short, ovate spikes or heads, sweet-scented. Corollas monopetalous. Flowers all summer. Per. *Red Clover.*

2. T. REPENS.

Heads umbellate; *legumes* 4-seeded; *stems* creeping. A common pasture plant, much valued by farmers. Stems several from the same root, spreading, extending 6—12 inches, rooting at the joints, smooth. Leaves ternate, on long stalks, leaflets roundish, lighter colored in the centre. Flowers white, in a dense head resembling an umbel, the stalk much longer than the leaves, solitary, axillary, angular. Pods included within the calyx. The White Clover grows in all soils, mountainous, meadow or rocky, and soon springs up in newly cleared lands. May—Sept. Per. *White Clover.*

3. T. PROCU'MBENS. *L.* T. procumbens and agrarium. *L.*

Spikes oval, imbricate; *vexillum* furrowed, reflexed, persistent; *stem* procumbent; *leaflets* obovate. An annual species, with bright yellow heads of flowers, found in dry pastures. Stems numerous, spreading, 6—12 inches in length. In richer soil, the stems are procumbent only at the base, afterwards erect or nearly so, slender, smoothish, reddish. Leaflets in 3s, obovate or roundish, the middle one stalked. Lower common leaf-stalks an inch in length, more or less. Spikes about 20-flowered, oftener hemispherical, small June. July. *Yellow Clover. Hop Trefoil.*

4. T. ARVE'NSE.

Heads cylindrical, very hairy; *calyx teeth* setaceous, longer than the corolla; *leaflets* narrow-obovate. A low plant, abundant in dry, sandy fields. Stems much branched, round, hairy, 6—12 inches high. Leaves hairy, on short petioles, of 3 narrow leaflets, half an inch to an inch long. Stipules ovate-lanceolate, acute, often red. Heads of white or pale red flowers, spiked, half an inch to an inch and a half long, very soft and downy, the slender, equal calyx teeth being densely fringed with fine, silky, reddish hairs, and projecting far beyond the corolla. Jl. Aug. Ann. *Hair's-foot Trefoil.*

5. T. ME'DIUM.

Stem branching, flexuous, suberect; *leaflets* oblong, subentire; *stipules* acuminate; *heads of flowers* loose, roundish; *calyx* hairy, with setaceous teeth. Heads large, deep purple. Leaves uniformly green. Introduced. Per.

6. T. REFLE'XUM.

Procumbent, pubescent; *leaves* obovate; *stipules* cordate, oblique; *heads* many-flowered; *flowers* pedicelled, at length reflexed; *legumes* about 3-seeded. Dry rocky hills in the S. States. Stems 12—18 inches in length. Leaves of 3 inversely egg-shaped, slightly serrate, soft, downy leaflets, variegated with white. Flowers large and handsome, red, in terminal and axillary heads, reflexed when in fruit. Jn. Per. *Buffalo Clover.*

11. DESMO'DIUM.

Calyx 5-cleft, bilabiate, bibracteolate at base; legume lomentaceous, compressed, composed of several 1-seeded, separable joints.

Gr. δεσμος, a bond; in reference to the slightly connected joints of the loment. Cal. lower lip 3-parted or 3-toothed, the upper, 2. Cor. papil. Vex. roundish. Keel obtuse. Sta. diadelphous, 9 & 1.—Herbaceous or suffruticose. Leaves pinnately trifoliate.

1. D. CANADE'NSE. *Dc.* Hedysarum Canadense. *L.*

Leaflets oblong-lanceolate, nearly smooth; *stipules* filiform; *bracts* ovate, long-acuminate; *flowers* racemed; *joints of the loment* obtusely triangular, hispid. Rather common in woods. A handsome plant, about 3 feet in hight. Stem upright, striate. Leaflets 3 inches long, broadest at base, pointed, nearly smooth. Flowers purple, at the top of the plant, in axillary and terminal racemes. Bracts long. Pods about 5-jointed. Jl. Per. *Bush Trefoil.*

2. D. ROTUNDIFO'LIUM. *Dc.* Hedysarum rotundifolium. *L.*

Stem prostrate, hairy; *leaflets* suborbicular, hairy on both sides; *bracts* broadly ovate, acuminate; *racemes* few-flowered; *joints of the lament* subrhomboidal. A hairy, prostrate plant, 2—3 feet in length, found in rocky woods. Leaves of 3 roundish leaflets, pale beneath, 1 or 2 inches in diameter, on hairy stalks. Stipules cordate, reflexed, hairy. Flowers purple, in axillary and terminal racemes. Pods about 6-jointed. Aug. Per. *Round-leaved Desmodium.*

3. D. CANE'SCENS. *Dc.* Hedysarum canescens. *L.*

Stem erect, branched, striate, scabrous; *leaflets* ovate, rather obtuse, scabrous on the upper surface, soft, villous beneath; *stipules* large, oblique, acuminate; *panicles* terminal, very long, densely canescent, naked; joints of the *loment* triangular; upper lip of the *calyx* nearly entire. An upright, branching plant, with very long panicles of flowers greenish externally, purple within. Stem 3 feet high, pubescent. Pods about 4-jointed. Found in woods. Aug. Perennial. *Green-flowered Desmodium.*

4. D. PANICULA'TUM. *Dc.* Hedysarum paniculatum. *L.*

Plant erect, smooth; *leaflets* thin, oblong-lanceolate; *stipules* subulate; *panicle* terminal, with long and slender pedicels; *bracts* lanceolate; joints of the *loment* rhomboidal. A handsome species, near 3 feet in hight, found in woods. Stem slender, striate. Leaves of 3, smooth, narrow leaflets broadest at the base, tapering to an obtuse point, about 3 inches in length, with subulate, deciduous bracts. Pods 4—5-jointed, large. Flowers purple, numerous. July. Per. *Panicled Desmodium.*

5. D. NUDIFLO'RUM. *Dc.* Hedysarum nudiflorum. *L.*

Leaves ternate, roundish-ovate, acuminate, slightly glaucous beneath; *scape* radical, panicled, smooth; joints of the *loment* obtusely triangular. Common in woods. It is remarkably distinguished by having its leaves and flowers on separate stalks, often distant from each other. Stem 8—10 inches high, with several ternate, long-stalked, smoothish, terminal leaves. Scape 2—3 feet long, slender, smooth, leafless, panicled, with many small, purple flowers. August. Per. *Naked-flowered Desmodium.*

6. D. ACUMINA'TUM. *Dc.* Hedysarum acuminatum. *M.*

Plant erect, simple, pubescent, leafy at top; *leaves* ternate, ovate, long-acuminate, the odd leaflet round-rhomboidal; *panicle* terminal, on a very long peduncle. Common in woods. Stem 8—12 inches high, ending in a slender panicle 1 or 2 feet long. Leaves at the top of the stem and below the panicle. Terminal leaflet roundish, 3 inches in diameter, lateral leaflets smaller, all of them covered with scattered, appressed hairs and conspicuously pointed. Flowers small, flesh-colored. Pod of about 3 triangular joints. July. Aug. Perennial. *Painted Desmodium.*

7. D. CUSPIDA'TUM. *T. & G.* Hedysarum cuspidatum. *Muh.*

Plant erect, smooth; *leaflets* oblong-oval or ovate, acuminate; *stipules* lanceolate-subulate; *racemes* paniculate, terminal, large, with scattered flowers; *bracts* ovate, acuminate, striate, smooth; joints of the *loment* suboval. A larger species than either of the preceding, found in woods. Stem branching, erect, 4 or 5 feet high. Leaflets 3 inches long, widest at base, smooth, entire, pointed. Stipules of the leaves ovate, long-acuminate, of the leaflets awl-shaped. Flowers large, purple, with conspicuous bracts. Pods in about six joints, long, pendulous, rough. Aug. Per. *Large Desmodium.*

8. D. CILIA'RE. *Dc.* Hedysarum ciliare.

Plant erect, slender, sub-pubescent; *leaves* crowded, on short, hairy petioles; *leaflets* small, ovate, short-stalked, pubescent beneath, ciliate on the margin; *stipules* filiform, caducous; *panicle* terminal, the lower branches much longer; joints of the *loment* 2 or 3, half-orbicular, hispid, reticulate. Woods. Hight 2 feet. Flowers purple. Aug. Per. *Fringed Desmodium.*

9. D. DILLE'NII. *Dar.* Hedysarum Marilandicun. *W.*

Plant erect, branching, hairy; *leaves* ternate, oblong, villose beneath; *stipules* subulate; *racemes* panicled; joints of the *loment* 3, rhomboidal, reticulate, a little hairy. A smaller species than either of the preceding. Stem 18 inches high, with a large, terminal, naked panicle. Flowers purple. Jl. Per.

10. D. MARILA'NDICUM. *Boott.* D. obtusum. *Dc.*

Plant erect, branching, hairy; *leaves* ternate, ovate, obtuse, subcordate at base; *stipules* subulate; *panicle* terminal; joints of the *loment* roundish, reticulate, hispid. About the size of the last, found in woods. Flowers greenish outside, purple within. Aug. Per. *Blunt-leaved Desmodium.*

11. D. GLUTINO'SUM.

Plant erect, simple; *leaves* ternate, long-stalked, round-ovate, acuminate; *panicle* or *scape* from the base of the stem; *peduncles* with glutinous hairs; joints of the *loment* oblong-triangular, nearly smooth. A singular species, intermediate between D. *nudiflorum* and *acuminatum*, 1 or 2 feet high, common in woods, N. H. Flowers purple. Jl. Per. *Clammy Desmodium.*

12. STYLOSA'NTHES.

Calyx tubular, very long, bearing the corolla; ovary a little distance below the corolla; legume 1—2-jointed, hooked.

Gr. στυλος, a style, ανθος, a flower; a flower with a long style. Cal. inferior, the tube very long, with the cor. and sta. inserted on its throat. Ova. inclosed in the tube of the calyx below the corolla.

S. ELA'TIOR.

Stem erect, pubescent on one side; *leaflets* lanceolate, smooth, acute; *bracts* lanceolate, ciliate, 3—4-flowered; *loment* 1-seeded. Found in dry, gravelly woods. Stem mostly erect, branched, a foot in hight, remarkable for being densely pubescent on that side only which is opposite the insertion of each leaf, while the other side is smooth. Leaves ternate, on short stalks, leaflets an inch or more in length. Bracts fringed with yellow bristles. Flowers yellow. Jl. Aug. Per. *Pencil Flower.*

13. TETRAGONOLO'BUS.

Legumes square, with 4 wings; alæ of the corolla cohering by their upper edge; filaments dilated upwards.

Gr. τεττα̃ρες, four, γωνια, an angle, λοβος, a bean.

T. E'DULIS. *Lk.* Lotus tetragonolobus. *L.*

Legumes solitary; *bracts* ovate; *leaves* ternate, the intermediate leaflets subdentate. A hardy climber, cultivated for the sake of its deep crimson, velvety flowers, and its curious pods. Native of Spain and Sicily, where its fruit was formerly used for food by the poor. This plant is celebrated in botanic history. Linnæus observed that its flowers became invisible in the evening, by being enveloped in their bracts, and reappeared in the morning. He was thus first led to consider the subject of the *Sleep of plants*, and to write upon it. July. Aug. Ann. *Winged Pea.*

14. TEPHRO'SIA.

Teeth of the calyx 5, subulate, nearly equal; keel obtuse, cohering with the wing; legume linear, much compressed, coriaceous; stamens diadelphous.

Gr. τεφρος, ash-colored; in allusion to the color of the foliage.—Herbs and shrubs, with unequally pinnate leaves.

T. VIRGINIA'NA. *Pers.* Galega Virginiana. *L.*

Erect, villous; *leaflets* numerous, oblong, acuminate; *raceme* terminal, subsessile; *legume* falcate, villous. About a foot high, with very beautiful white and purple flowers, found in dry woods. The whole plant is covered with a whitish down. Leaves pinnate, with 10—12 pairs of pale green leaflets, surmounted by an odd one. Calyx red. Banner white, keel rose-colored, wings red. July. Per. *Cut-gut. Goat's Rue.*

15. GLYCYRRHI'ZA.

Calyx tubular, regular, 5-parted; vexillum erect, reflexed at the sides; alæ spreading; carina bifid; legume oblong, smooth, 3—4-seeded.

Gr. γλυκυς, sweet, ριζα, root; from the well known properties of the liquorice root.

G. OFFICINA'LIS.

Legumes smooth; *stipules* none; *leaflets* ovate, retuse, clammy beneath. The liquorice plant is deep-rooting, perennial, herbaceous. Native of S. Europe. Its stalk rises about 4 feet. Flowers light blue, in axillary spikes. Leaves pinnate, of about 11 leaflets. This plant is cultivated in plantations for the sake of its roots, and its extract, of the shops. The best soil for its culture, is a deep, sandy loam, which must be spaded or plowed to the depth of 2 feet. It is increased by cuttings of the root, which should be planted in the autumn, in rows, and afterwards hoed and weeded as necessary. After the third summer's growth, the roots are taken up and preserved in sand for sale or use. *Liquorice.*

16. A'RACHIS.

Calyx 2-lipped; corolla resupinate; filaments united; legume gibbous, torulose, veiny, coriaceous.

An ancient Lat. name of a subterranean plant.

A. HYPOGÆ'A.

Leaves in 4s, cuneate, rounded; *stipules* undivided; *stem* nearly smooth. Native of S. America. As the pods increase in size, they force themselves into the ground, and there ripen their seeds. Hence the specific name, which signifies under ground. In Carolina the seeds are used as chocolate. Plant 2 feet high. Flowers yellow. May. Jn. Per. *Pea Nut.*

17. BAPTI'SIA.

Petals of nearly equal length; calyx 4—5-cleft half way; legume inflated, many-seeded.

Gr. βαπτω, to dye; a use to which some species are applied. Cal. 4—5-cleft, sub-bilabiate, persistent. Sta. deciduous. Ova. stiped. Legumes often few-seeded by abortion.—Perennial herbs.

B. TINCTO'RIA.

Leaves ternate, stalked; *leaflets* roundish, obovate; *stipules* setaceous, obsolete. A common plant, very glabrous, and much branched, 2 or 3 feet high. Leaflets on short petioles, in 3s, tapering to a point at the base. Stipules very short. Flowers yellow, in loose, terminal racemes. Legumes short, roundish, long-stiped. The leaves become black in drying. Woods and dry soils. July. Per. *Wild Indigo.*

18. PHACA.

Calyx 5-toothed; keel obtuse; legume turgid, 1-celled; placenta swelling.

Gr. φακη, lentil, derived from φαγω, to eat. Two upper teeth of cal. often divaricate.—Perennial herbs. Fls. in axillary racemes.

P. NEGLE'CTA. *T. & G.*

Erect, branching, nearly smooth; *leaflets* elliptical, 11—17; *stipules* minute; *racemes* many-flowered, rather loose; *legume* sessile, smooth, roundish-ovate, much inflated, with a deep groove at the ventral suture. Western N. Y., by streams and lakes. A plant about 2 feet high, resembling the Astragalus Canadensis, but more slender and delicate. Flowers white. Seeds small and numerous. June. July.

19. ASTRA'GALUS.

Calyx 5-toothed; keel of corolla obtuse; legume with a longitudinal, half-breadth partition attached to one edge.

A Greek name of uncertain application. Cal. tubular, lower toothlets gradually less. Cor. papil. Vex. larger than the other pet., emarginate, obtuse, straight. Wings length of keel. Ova. subcolumnar.—Herbaceous or half-shrubby, more or less canescent, with hairs fixed in the middle. Leaflets numerous, with an odd one.

A. CANADE'NSIS.

Canescent, erect, diffuse; *stipules* broad-lanceolate, acuminate; *leaflets* about 10 pairs with an odd one, elliptical, obtuse at both ends, the lowest ovate-obtuse; *peduncles* about as long as the leaves, when in fruit shorter; *spikes* oblong; *flowers* spreading, somewhat reflexed; *legumes* ovate-oblong, terete, suberect, smooth, 2-celled, many-seeded, abrupt at the end and tipped with a permanent style. River banks, &c. At the ferry, Niagara Falls. Stem bushy, about 3 feet high, very leafy. Flowers greenish yellow, in short, dense spikes. Pods ½ inch in length, leathery. Jl. Aug. *Canadian Milk Vetch.*

20. INDIGO'FERA.

Calyx spreading; carina with a spreading, subulate spur on each side.

Lat. *indigo, fero*, that is, a plant bearing indigo.

I. TINCTO'RIA.

Leaves pinnate, oblong, smooth, with 9 leaflets; *racemes* shorter than the leaf; *legumes* round, arcuate. A low shrub, native of E. India. From this, and *I. argentea*, are chiefly obtained the useful drug Indigo. For this purpose it is extensively cultivated in the W. Indies and in Hindostan. At any season of the year it is planted in rows in a free, rich soil. Being kept clear of weeds, it is fit for cutting in 2 or 3 months,—a process which in rainy seasons may be repeated every six weeks. Being cut, the herb is first steeped in water until it has imparted all its coloring matter. The liquor is then let off into a series of vats, in which, after a peculiar process called beating, with filtration and evaporation, it ultimately deposits the colored fecula or indigo. This is then cut into pieces about an inch square, dried, packed in casks or bags, and is ready for sale. An acre of ground well managed will yield 25 lbs. a year. *Indigo.*

21. A'PIOS.

Calyx campanulate, obscurely bilabiate, the upper lip of 2 very short, rounded teeth, the 2 lateral teeth nearly obsolete, the lower one acute and elongated; keel falcate, pushing back the broad, plicate vexillum at top; ovary sheathed at base.

Greek name for the wild pear, which the root resembles in form.—Perennial herbs, twining, smooth. Root bearing edible tubers. Lvs. of 5—7 leaflets.

A. TUBERO'SA. *P.* Glycine apios. *L.*

Leaves pinnate, of 7 ovate-lanceolate leaflets; *racemes* shorter than the leaves; *stem* twining. Found in shady woods and thickets, twining about other plants. Stem round, 2—4 feet in length. Leaves rather numerous, each consisting of 3 (rarely 2) pairs of leaflets and an odd, terminal one. These are ovate, narrow, more or less pointed, smooth, on short pedicels. Racemes axillary, solitary, 1—3 inches long, crowded. Flowers dark purple. To the root are appended oval, fleshy tubers, which are very nutritious, and would perhaps be cultivated had we not the potato. Jl. Aug. Per. *Ground Nut.*

22. COLLU'TEA.

Calyx 5-toothed; vexillum with 2 callosities, unfurled, larger than the blunt carina; stigma lateral, under the hooked

end of the style, which is longitudinally bearded behind; legume inflated, scarious.

C. ARBORES'CENS.

Leaflets elliptical, retuse; *banner* gibbous, short behind. A shrubby plant, several feet in hight, native of France. The leaves are pinnate. Flowers yellow, pods inflated. The leaves are used in medicine instead of senna. June—Aug. *Bladder Senna.*

23. ROBI'NIA.

Calyx short, 4-cleft, the upper segment 2-parted; vexillum broad, large; legume compressed, elongated, many-seeded.

In memory of John Robin, herbalist to Louis XIV. Cal. small, camp., the inferior teeth narrowest, all equal in length. Cor. papil., each wing with a short, blunt, appendage.—Trees and shrubs, with stipular spines. Flowers showy, in pendant, axillary racemes.

1. R. PSEUDACA'CIA.

Leaves pinnate, with a terminal leaflet; *stipules* prickly; *racemes* pendulous; teeth of the *calyx* unarmed; *legumes* smooth. The Locust Tree grows native in Pennsylvania and the more southern and western States, and is abundantly naturalized in New England. In the durability, hardness and lightness of its timber, and the beauty of its foliage and flowers, it is exceeded by few trees of the American forest. West of the Alleganies it sometimes attains the hight of 80 feet, with a diameter of 3 or 4. In N. England it seldom exceeds half the above dimensions. The pinnate leaves have a beautiful symmetry of form, each composed of 8—12 pairs of leaflets, with one at the end. These are oval, thin, nearly sessile, and very smooth. Flowers in numerous, pendulous clusters, diffusing an agreeable fragrance. These are succeeded by a narrow, flat pod, with 5 or 6 small brown seeds. When young, the tree is armed with thorns which disappear in its maturity. May. *Locust Tree.*

2. R. HI'SPIDA.

Racemes subaxillary, suberect; *calyx* acuminate; *stem* mostly unarmed; most of the plant hispid; *leaves* pinnate, with a terminal leaflet; *leaflets* elliptical, mucronate. A beautiful shrub, native of the S. States. It is cultivated in our gardens for the sake of its numerous, large, red flowers. Hight 3--5 feet. May. *Rose Acacia.*

β. rosea has its branches nearly smooth.

3. R. VISCO'SA.

Racemes with 1-flowered pedicels; *branches* and *pods* viscid, with glands. This beautiful tree is from the South, where it attains the hight of 40 feet. The flowers numerous, rose-colored, in erect, axillary clusters, with the thick, dark green foliage, render this tree one of the most brilliant ornaments of the park or the garden. Apr. *Clammy Locust.*

24. CORONI'LLA.

Calyx 2-lipped; petals with claws; loment subterete, jointed; flowers in umbels; seeds mostly cylindrical.

Lat. *corona*, a crown; its pretty flowers are disposed in tufts like coronets.

1. C. E'MERUS.

Peduncles about 3-flowered; claws of the *corolla* about 3 times as long as the calyx; *stem* angular, woody. A beautiful shrub, native of France. Stem about 3 feet high, square, with opposite branches. Leaflets about 7, broad, obcordate. Flowers rose-colored, collected in tufts on the end of axillary stalks. *Scorpion Senna.*

2. C. ARGE'NTEA.

Leaflets 11, silky, the terminal one largest. A smaller species than the above, but more beautiful, about 2 feet high, native of Crete. In May and June it bears a profusion of yellow flowers which have a sweet scent. In a poor dry soil its appearance is silvery, in a richer soil it becomes glaucous. *Silvery-leaved Coronilla.*

25. CROTALA'RIA.

Vexillum cordate, large; keel acuminate; filaments all united into a sheath which is cleft on the upper side; legume pedicellate, turgid.

Gr. κροταλον, a noisy musical instrument of the Greeks; from the rattling of the pods when shaken. Cal. with 3 deep divisions, 2 upper ones lanceolate, pressing on the vex., the lower one lanceolate, concave, deeply 3-cleft. Cor. papil. Vex. larger than the ovate wings.—Herbs or shrubs.

C. SAGITTA'LIS.

Plant erect, branching, hairy; *leaves* simple, lanceolate; *stipules* opposite, acuminate, decurrent; *racemes* 3-flowered, opposite to the leaves; *corolla* shorter than the calyx. A plant about a foot high, with a hairy aspect, and inflated pods, common in woods and sandy fields. Stem herbaceous, rigid. Leaves alternate, entire, nearly sessile, rounded at the base. The plant is best distinguished by its opposite, united, decurrent stipules, so situated that each pair appears inversely sagittate; hence the specific name. Leaves of the calyx long, hairy. Corolla small, yellow. Seeds few, rattling in the turgid pod. Jl. Ann. *Rattle-box.*

26. ULEX.

Calyx of 2 leaves, with a small scale at the base on each side; legume turgid, scarcely longer than the calyx.

A word of uncertain origin.

U. EUROPÆ'US.

Leaves linear-lanceolate, villose; *bracts* ovate, lax; *branchlets* erect. A beautiful evergreen shrub, native in various parts of Europe, where it is often found extremely common. It forms a coarse fodder, is sometimes used for hedges. Hight about 6 feet. Flowers of a brilliant yellow, but with numerous thorns. Flowering all summer. Per. *Furze.*

27. GENI'STA.

Calyx with the upper lip 2-parted and the lower 3-toothed; vexillum oblong; keel oblong, straight, scarcely including stamens and style; stigma involute; stamens monadelphous.

Celtic *gen*, Fr. *genet*, a small, bushy shrub. Leaves simple. Flowers yellow. Legume many-seeded.

G. TINCTO'RIA.

Leaves lanceolate, smooth; *branches* round, striate, unarmed, erect; *legumes* smooth. A naturalized species, found occasionally in dry, hilly grounds. Stems or branches numerous, ascending or erect, a foot high, from long, woody, creeping roots. Leaves sessile, alternate. Flowers bright yellow, axillary, sessile or nearly so, solitary. The whole plant dyes yellow, and with woad, green. Aug. Per. *Dyer's Broom. Wood Waxen.*

28. CERCIS.

Corolla scarcely papilionaceous; wings longer than the banner; keel 2-petaled; calyx 5-toothed; pod compressed, with the seed-bearing suture winged; seeds obovate.

Gr. κερκις, a weaver's shuttle; from the resemblance of the pods. Trees, with simple cordate leaves and rose-colored flowers.

C. CANADE'NSIS.

Leaves cordate, acuminate. A handsome tree, 20 or 30 feet high. The leaves are round, heart-shaped, pointed, hairy at the axils of the nerves, with minute stipules. The flowers are abundant, and having an agreeable poignancy of flavor, are picked and used as salad in Canada. The wood is finely veined with black and green, and receives a fine polish. The young twigs will dye wool of a nankeen color. The old author Gerard, in compliance with the popular notion of his time, says "This is the tree whereon Judas did hang himself, and not upon the elder-tree as it is said." Blossoms in May. *Judas Tree.*

29. LUPI'NUS.

Stamens monadelphous; calyx deeply bilabiate, upper lip 2-cleft or toothed; anthers alternately rounded and oblong; legume coriaceous, swelling at the seeds.

Lat. *lupus*, a wolf; because this plant overruns the soil, and devours as it were all its fertility.—Herbs, with palmate, 5—15-foliate leaves.

1. L. PERE'NNIS.

Root creeping, perennial; *leaves* digitate; *flowers* alternate; *calyxes* without appendages, upper lip emarginate, lower entire. Grows wild abundantly in sandy woods and hills, particularly about Lake Champlain. It is a beautiful plant, much cultivated in gardens. It is often called sun-dial, from the curious circumstance of its leaves turning to face the sun from morning till night. Stem erect, soft, smoothish, a foot high. Leaves soft, downy, on long stalks. Leaflets 7—9, arranged in a stellate manner, lanceolate, broadest above the middle. Flowers blue, varying to white, in a terminal spike or raceme. May. June. Per. *Common Lupine.*

2. L. NOOTKATE'NSIS.

Calyx whorled, without appendage; *lower lip* entire; *stem* and *leaves* hairy. A tall, handsome plant from Nootka Sound, very ornamental for the garden. Stem herbaceous, erect, hairy, 6 feet high. Leaves digitate, on long stalks,

hairy, each consisting of about 7, narrow, lanceolate leaflets arranged in a stellate manner. Flowers large, purple, in a terminal raceme. June—Aug. Perennial. *Nootka Sound Lupine.*

The other species cultivated in gardens, are L. *albus*, an annual plant, with white flowers; L. *pilosus*, Rose Lupine, annual, with rose-colored flowers; L. *lutens*, Yellow Lupine, annual, with yellow flowers; L. *hirsutus*, Garden Lupine, annual, with blue flowers and an appendaged calyx.

30. CA'SSIA.

Calyx 3-leaved; corolla 5-petaled; the 3 upper anthers sterile, 3 lower ones beaked.

From the Hebrew name *Katzioth.* Cal. lax, concave, colored, deciduous. Pet. roundish, concave, lower ones more distant, longer and more spreading. Fil. declined, 3 lower ones larger, 3 lower anthers very large, 3 upper small, barren. Leaves abruptly pinnate.

1. C. MARILA'NDICA.

Smooth; *leaflets* in 8 or 9 pairs, oblong-lanceolate, mucronate, equal, an obovate gland on the common petiole; *flowers* in axillary racemes and terminal panicles. This beautiful plant is frequently met with in alluvial soil, growing in close masses, 4—6 feet high. The stem is round, striate, with scattered hairs. Petiole channelled above, and distinguished by the pedicelled gland near the base. Petals bright yellow, 3 above and 3 below. In medicine it is used as a mild cathartic, Aug. Per. *American Senna.*

2. C. CHAMÆCRI'STA.

Leaves in many pairs; gland of the *petiole* stiped; *stipules* ensiform. An elegant plant, a foot or more high. Stem round, pubescent. Leaves pinnate, in about 12 pairs. Flowers on short peduncles, large, yellowish, two upper petals with a purple spot. Its leaves possess considerable irratibility, as do also those of the following species. Dry grounds. Has been cultivated in Virginia for the purpose of recovering worn out lands. Aug. Ann. *Dwarf Cassia.*

3. C. NI'CTITANS.

Leaflets 12--30; *flower* pentandrous. Stem erect, about a foot high, slender, pubescent, a little branched. The leaflets are in many pairs, oblong, obtuse, with a bristly point, crowded, having a pedicelled gland below the lowest pair. Flowers pale yellow, small, axillary, on short peduncles. An irritable plant, closing its leaves when touched, and in the night. Jl. Ann. *Virginian Cassia.*

31. CÆSALPI'NA.

Calyx cup-shaped at the base, of 5 united, subequal sepals; corolla of 5 unequal, unguiculate petals; stamens 10, all fertile, ascending; legume 1-celled; seeds several, flat.

Named in honor of Cæsalpinus, physician to Pope Clement VIII, and the earliest writer on systematic botany.--Trees and shrubs, with abruptly bipinnate leaves.

C. PULCHE'RRIMA.

Aculeate; *leaflets* obovate; *calyx* smooth; *petals* fimbriate, on long claws; *flowers* on long pedicels. An ornamental shrub from W. India, with large, orange-colored, variegated flowers.

32. MIMO'SA.

Flowers polygamous. *Perfect fl.*—Calyx 5-toothed; corolla 0, or 5-toothed; stamens 4—15; legume separated into one-seeded joints; *sterile fl.* like the perfect, but without ovaries or fruit.

Gr. μιμος, a buffoon; because the leaves seem as if sporting with the hand that touches them.

M. SENSITI'VA.

Stem and *petiole* prickly; *leaflets* in pairs, the interior ones minute. Native of Brazil. Slender, about 18 inches high, with small, pink flowers.

33. ACA'CIA.

Flowers polygamous. Calyx 4-toothed; corolla tubular, campanulate, 4—5-cleft; stamens 8—200; legume not jointed, many-seeded.

A large and exceedingly ornamental genus, abounding in important products, as *Catechu* and *Gum Arabic*, and is of very easy culture in the greenhouse. They are trees, often shrubs.

A. JULIBRA'SSIN is a small, ornamental tree, native of Persia. Leaves with 8—12 pairs of pinnæ. Flowers white, with a multitude of long, silky stamens, on account of which the Persians have called it *Gul ebruschim*, i. e. Rose of silk.

34. GYMNOCLA'DUS.

Flowers diœcious. *Sterile fl.*—Calyx tubular, 5-cleft; corolla 5-petaled. *Fertile fl.*—Calyx and corolla as above; style 1; legumes 1-celled, pulpy inside; seed large, roundish and hard.

Gr. γυμνος, naked, and κλαδος, a shoot; on account of the naked appearance of its strange, rigid shoots in winter.

G. CANADE'NSIS.

Leaves bipinnate; *leaflets* oval, acuminate, pubescent. The Coffee tree is found in Western N. Y., Ohio, &c., on the borders of lakes and rivers. It grows to the hight of 50 feet, with a diameter of 15 inches. The trunk is straight and simple, 25 feet, covered with a very rough, scaly bark, and supporting a rather small, but regular head. The compound leaves are 2—3 feet long and 15—20 inches wide, being doubly compounded of a great number of dull green leaflets. Flowers large and white, succeeded by large, curving pods containing several hard, gray seeds. The wood of the Coffee tree is reddish, fine-grained and strong, and is valuable in architecture, and in cabinet-work. May—July.

35. GLEDITSCHIA.

Flowers polygamous. *Perfect fl.*—Calyx 4-cleft; corolla 4-petaled; stamens 6—8; legume long, compressed. *Staminate fl.*—Calyx 3-leaved; petals 3; stamens 6. *Pistillate fl.*—Calyx 5-leaved; petals 5; legume as above.

Named in honor of John G. Gleditsch of Leipzig, a distinguished botanical writer, about 1750.

G. TRICA'NTHUS.

Branches armed with thick, triple spines; *leaves* pinnate, of linear-oblong leaflets; *legumes* very long, compressed. This fine tree is rarely found native in the Atlantic States, but belongs peculiarly to the Western. It is accasionally, and deserves to be generally cultivated for ornament and shade. In favorable circumstances it will attain the hight of 70 feet, with a trunk undivided half its length, and 3 or 4 feet in diameter. The thorns with which the branches are armed in a most formidable manner, are 2—3 inches long, ligneous, often having 2 secondary thorns branching from the sides. The foliage is light and elegant. Flowers small, white, succeeded by flat, crooked, hanging pods 12—18 inches in length, and of a dull red color, remaining on the tree long after the leaves are fallen. They contain flat, brown, hard seeds, and a fleshy substance which is at first very sweet, but becomes sour. June. *Honey Locust.*

ORDER LI. MYRTACEÆ. *The Myrtle Tribe.*

Cal.—Adherent below to the compound ovary, the limb 4—5-cleft, valvate.
Cor.—Petals as many as the segments of the calyx.
Sta.—Indefinite. *Anthers* introrse. *Style* and stigma simple.
Fr.—With many seeds.

A fine order of trees and shrubs, distinguished by its opposite, exstipulate, dotted, entire leaves, generally with a vein running close to the margin. Native of warm or torrid countries, especially of S. America and the E. Indies.

Properties. A fragrant or pungent volatile oil, residing chiefly in the pellucid dotting of the leaves pervades the order. The Caryophyllus aromaticus, native of Arabia, a tree about 20 feet in hight, yields the clove (*clou* Fr. a nail) which is the *dried flower*. *Cajeput oil* is distilled from the leaves of the Melaleuca Cajeputi, native of the E. Indies. A kind of *gum kino* is obtained from Eucalyptus resinifera, also a native of India. The root of the Pomegranate yields an extract which is an excellent vermifuge.—All the genera are exotic with us.—Many of them are highly ornamental in culture.

Genera.

Fruit 2—3-celled. Leaves evergreen, with a marginal vein,	*Myrtus.*	1
Fruit many-celled. Leaves deciduous, without the marginal vein,	*Punica.*	2

1. MRYTUS.

Calyx superior; petals 5; berry 2—3-celled, many-seeded.

Gr. μυρον, perfume.

M. COMMU'NIS.

Flowers solitary; *involucra* 2-leaved; *leaves* ovate. This popular shrub is a native of S. Europe. In our climate it is reared only in houses and conservatories. Among the ancients it was a great favorite for its elegance of form, and its fragrant, evergreen leaves. It was sacred to Venus. The brows of bloodless victors were adorned with myrtle wreaths, and at Athens it was an

emblem of civic authority. The flowers are white, appearing in July and August. *Common Myrtle.*

2. PU'NICA.

Calyx 5-cleft, superior; petals 5; berry many-celled, many-seeded; seeds berried; placentæ parietal.

The *pomegranate* was anciently called Malum Punicum, Carthagenian apple, because, says Pliny, it was first known to grow there.

P. GRANA'TUM.

Leaves lanceolate; *stem* arborescent. This is a thorny bush when wild, from S. Europe, where it is sometimes used for hedges like the hawthorn. The leaves are lanceolate, entire, smooth. The flowers are scarlet, large, and make a fine appearance. The fruit is large, highly ornamental and of a fine flavor. Much care is requisite for its cultivation. It requires a rich loam, a sunny situation, protected by glass. In this way double flowers of great beauty may be produced.

ORDER LII. MELASTOMACEÆ.

Cal.—Sepals 4—6, united, persistent, the tube urceolate, cohering with only the angles of [the ovary.
Cor.—Petals as many as the segments of the calyx, twisted in æstivation.
Sta.—Twice as many as the petals, sometimes of the same number, the filaments inflexed in [æst.
Anth.—Before flowering contained in the cavity between the cal. and the sides of ova.
Fr.—Capsular or baccate.

A family represented in the Northern States by a single species. The remainder of it is chiefly native in India and tropical America, where more than 600 species are found. No plant of this order is poisonous. All are slightly astringent.

RHE'XIA.

Calyx 4-cleft, swelling at the base; petals 4; anthers 8, style declined; capsule 4-celled, invested by the calyx; placentæ prominent; seeds numerous.

Gr. ῥῆξις, a rupture; the plant being considered good for healing wounds. Herbs, &c. Leaves opposite, exstipulate.

R. VIRGI'NICA.

Stem with 4 winged angles; *leaves* sessile, ovate-lanceolate, ciliate-serrate; *corymbs* dichotomous. Stem square, the angles winged, a foot or more high, with 3-nerved, closely sessile leaves, covered with scattered hairs. Flowers large, axillary and terminal. Petals bright purple, caducous, obovate, hispid beneath. Anthers long and prominent, crooked, of a golden yellow above and a purple line beneath. Style somewhat longer than the stamens, declined. Grows in wet grounds; rare. Jl. Aug. Per. *Meadow Beauty. Deer-grass.*

ORDER LIII. LYTHRACEÆ.

Cal.—Tubular, the limb 4—7-lobed, sometimes with as many intermediate teeth.
Cor.—Petals inserted into the calyx between the lobes, very deciduous, or 0.
Sta.—Equal in number to the petals or 2—4 times as many, inserted into the calyx.

Ova.—Superior, enclosed in the calyx tube, 2—4-celled. *Styles* united into one.
Fr.—Capsule membranous, enveloped in the calyx, usually by abortion 1-celled.
Sds.—Small, numerous, attached to a central placenta. *Albumen* 0.

Herbs, rarely shrubs, with square branches, usually opposite and destitute of either stipules or glands. Some of the species are found in temperate climes, but most of them are tropical. Lythrum Salicaria, native of Europe, N. Holland and U. S., is used for tanning where it abounds. All the species are astringent.

Genera.

Calyx bell-shaped, intermediate teeth none, ...	*Ammannia.*	1
Calyx cylindric, intermediate teeth minute, ...	*Lythrum.*	2
Calyx short, intermediate teeth long, horn-like, spreading . . .	*Decodon.*	3

1. AMMA'NNIA.

Calyx tubular, 4—5-toothed, campanulate; stamens 4—8; capsule 2—4-celled, many-seeded.

Named for John Ammann, native of Siberia and professor of Botany at St. Petersburg.—Herbs of no beauty. Cal. plaited. Cor. 4-petaled, inserted in the calyx or often 0. Sta. seldom 8.

A. HU'MILIS. *Mx.* A. ramosior. *L.*

Stem procumbent; *leaves* lanceolate, narrow at the base; *flowers* solitary, axillary, sessile. A small marsh plant, half a foot in hight. Flowers purplish. Aug. Sept. *Low Ammannia.*

β. Leaves broadest at base, half-clasping. Flowers in close bunches in lower axils, solitary above.

2. LYTHRUM.

Calyx cylindric, striate, 8—12-toothed, alternate ones minute; petals 4—6, equal; stamens as many, or twice as many as the petals; style 1; capsule 2-celled, many-seeded.

Gr. λυθρον, black-blood; in allusion to the color of the flower. Petals oblong, with short claws. Filaments shorter than cor. the 6 alternate ones shorter, or wanting. Caps. pointed, enclosed in the tube of the calyx. Seeds many.—Herbs.

1. L. HYSSOPIFO'LIUM.

Leaves alternate, linear-lanceolate; *flowers* axillary, solitary, hexandrous. A slender, weedy plant, found in low grounds, dried beds of ponds, &c. Stems 6—10 inches high, erect, with spreading branches. Leaves sessile, obtuse, alternate. Flowers small, axillary, sessile, pale-purple. Calyx segments small, 12. Stamens 6. Autumn. Ann. *Grass-poly.*

2. L. SALICA'RIA.

Leaves lanceolate, cordate at base; *flowers* nearly sessile, in a long spike; *petals* purple. Wet meadows, rare. Flowers large, with 4—6 petals. The plant is quite ornamental and is sometimes cultivated. It is remarkable for being the only species of this order yet discovered in New Holland. June, July. *Loose-strife.*

3. DE'CODON.

Calyx short, 10-toothed, the alternate ones cornute, spread-

ing; stamens 10, alternate ones very long; style filiform; capsule globose, included, many-seeded.

Gr. δεκα, ten, οδους, a tooth; from the horn-like teeth of the calyx.—Perennial herbs, with opposite or whorled leaves and axillary purple flowers.

D. VERTICILLA'TUM.

Pubescent; *leaves* opposite and in whorls of 3, sessile, lanceolate; *flowers* axillary, nearly verticillate; *stamens* 10—12. Swamps. Stem woody at base, 4 or 6-angled, 2 feet high, often prostrate and several feet in length, with whorls of 2 or 3 lanceolate, entire leaves. Flowers in axillary corymbs, apparently whorled, constituting a long, cylindric, leafy, terminal and showy raceme. Calyx segments 10—12. Petals 5 or 6, of a fine purple. Jl. Aug. Per.
Swamp-Willow-herb.

ORDER LVI. ONAGRACEÆ.

Cal.—Sepals 4, (2—6) united below into a tube, the lobes valvate in æstivation.
Cor.— } Petals 4, (2—6) inserted with the 4 or 8 (1—2—3—8) stamens into the throat of the
Sta.— } calyx. *Pollen* triangular, often cohering by threads.
Ova.—Coherent with the tube of the calyx; placenta in the axis.
Fr.—Baccate or capsular, 2—4-celled, many-seeded. *Albumen* none.

Herbs, rarely shrubs, particularly abundant throughout America, more rare in the Old World. They possess no remarkable properties. Many genera are ornamental, and one, the well known Fuchsia, is so to a high degree.

To this order is appended the suborder HOLORAGEÆ, consisting of aquatic herbs of a low grade, the flowers being imperfect or reduced to solitary parts or organs.

Conspectus of the Genera.

Parts of fl. arranged					
		Herbs.	Pet. scarcely clawed;	Seeds comose,	*Epilobium.* 1
				Seeds naked,	*Enothera.* 2
			Pet. clawed;	Claws unarmed,	*Gaura.* 3
				Claws with 2 teeth,	*Clarkia.* 5
		Sta. 8;	Beautiful green-house shrubs,		*Fuchsia.* 6
	Fls. perf.	Stamens 4;	styles united into 1,		*Ludwigia.* 4
by 4s;		Flowers monœcious;	aquatic; leaves multifid,		*Myriophyllum.* 9
by 3s;		flowers apetalous;	aquatic; leaves pectinate,		*Proserpinaca.* 8
by 2s;		flowers complete and regular;	leaves entire,		*Circæa.* 7
by 1s;		flowers apetalous;	aquatic; leaves verticillate,		*Hippuris.* 10

TRIBE 1, ONAGREÆ.

Flowers perfect, the parts arranged in 4s (rarely 3s); pollen connected by threads.

1. EPILO'BIUM.

Calyx 4-cleft, tubular; corolla 4-petaled; stamens 8; capsule oblong, inferior; seeds comose, with a tuft of long hairs.

Gr. επι, upon, and λοβος, a pod; that is, a flower growing upon a pod. Cal. superior, deeply cleft into 4 oblong, colored, deciduous segments. Cor. of four roundish petals, inserted between the segments of the calyx. Fil. subulate, alternate ones shorter. Ova. inferior, very long, 4-valved.—Per. herbs.

E. ANGUSTIFO'LIUM. *L.* E. spicatum. *Lam.*

Leaves scattered, liner-lanceolate, entire, veiny; *flowers* unequal. The tall, showy racemes of rose-colored flowers in July and Aug., readily distinguish this plant. Grows in low, shady grounds, stem often six feet high, round, branching above. Leaves narrow, smooth, glaucous beneath. Flowers bluish

purple, numerous, in long, terminal, erect racemes. Petals unequal, with claws. Stamens unequal in length, declining. Style longer than the stamens, on a long, linear ovary, which when ripened, discloses numerous seeds winged with long, silky down. *Rose-bay. Willow-herb.*

2. E. COLORA'TUM.

Stem round, puberulent; *leaves* lanceolate, serrulate, petioled, opposite, upper ones alternate, smooth, veiny. Found in wet grounds. Stem 1—3 feet high, becoming very much branched. Leaves with red veins, on short, decurrent petioles, conspicuously covered with whitish dots. Flowers axillary, regular, purple, on very long ovaries. Jl. Aug. Per. *Colored-Willow-herb.*

3. E. PALU'STRE.

Stem round, minutely pubescent; *leaves* subsessile, lanceolate, subdenticulate; *stigma* undivided. In marshes. Stem 2—3 feet high, very branching, with alternate, slightly toothed leaves. Petals obcordate, rose-color, about twice as long as the calyx, on an ovary longer than the leaves. Jl. Per. *Marsh-Willow-herb.*

β. albiflorum. (E. lineare. M). *Stem* slender, at first simple, branched at top; *leaves* linear, entire, revolute at the margin; *capsules* canescent.

4. E. ALPI'NUM.

Stem 1—2-flowered, simple, roundish; *leaves* opposite, elliptical, entire. Mountains. Stem decumbent, a few inches long, with about 2 rose-colored flowers, and obtuse, short-stalked leaves. Jn. Jl. Per. *Alpine Willow-herb.*

5. E. MOLLE.

Covered with a soft, thick pubescence like velvet; *stem* round, straight, branching above; *leaves* opposite, crowded, linear, obtusish; *petals* emarginate, double the length of the calyx. Stigma large, clavate. Flowers pale purple or rose-color. *Soft-Willow-herb.*

2. ŒNO'THERA.

Calyx 4-cleft, tubular, segments reflexed; petals 4, mostly obovate; stamens 8, sometimes equal; capsule 4-celled, 4-valved, inferior; seeds naked.

Gr. οινος, wine, and θηρω, to hunt; because the root when eaten is said to be an incentive to wine drinking. Cal. superior, with a long tube. Pet. inserted into the top of the tube. Fil. awl-shaped, incurved, shorter than the petals. Stig. divided into 4, obtuse, spreading seg. Seeds many.—Herbs.

1. Œ. BIE'NNIS.

Leaves ovate-lanceolate, flat; *stem* rather rough and villose; *stamens* shorter than the corolla. A tall plant, with fine straw-colored flowers, common about fences, flowering from July to September. Stem rough, leafy, furrowed, 3—5 feet high. Leaves pubescent, slightly toothed, alternate, sessile on the stem, those of the root tapering into a foot-stalk. Flowers numerous, thickly clustered in terminal spikes. Their mode of expansion is curious. It takes place at evening. When the flower has acquired a sufficient expansive force, the calyx suddenly bursts with a perceptible sound, and instantly expands, allowing the petals to unfold rather more at their leisure. They wither during the following day. *Evening Primrose. Scabish.*

β. muricata. Stem muricate, purple; *stamens* as long as the corolla. Leaves narrow-lanceolate, acute at each end. Stem 1—2 feet high. July.

2. Œ. PU'MILA.

Leaves lanceolate, entire, obtuse; *capsules* slightly stalked, elliptical, ovate, angular. A small, half-erect plant, common in grass lands, continuing to blossom through the summer. Stem 6—10 inches high, oblique at base, round, slender, with sessile leaves. Flowers yellow, small, in a leafy spike, opening in succession, one or two at a time. Per. *Dwarf Evening Primrose.*

3. Œ. FRŬTICO'SA.

Leaves linear-lanceolate, subdentate; *petals* broad-obcordate; *capsule* stalked, oblong-clavate, angular; *raceme* naked below. An annual species, with a hard, suffruticose, purple stem, 1—2 feet high, found in woods and sandy plains. Leaves punctate. Flowers yellow. June. *Shrubby Œnothera.*

4. Œ. LINEA'RIS.

Stem slender, often decumbent at base, much branched; *leaves* narrow-lanceolate, obtuse, somewhat denticulate; *flowers* large, in terminal corymbs; *tube* of the calyx longer than the ovaries; *petals* longer than stamens; *capsules* canescent, with alternate, slightly winged angles, tapering at base. Stem 1—2 feet high. April—July.

5. Œ. CHRYSA'NTHA.

Stem ascending, slender; *flowers* small, crowded, spicate; *tube* of the calyx equal in length to the ovary, longer than the segments; *petals* orange-yellow, obovate, emarginate, longer than the stamens; *capsules* smooth, clavate, the alternate angles slightly winged; *leaves* lanceolate, obtuse, attenuate at base, denticulate, radical ones spathulate. Stem 1—2 feet high. Jn. Jl.

3. GAURA.

Calyx 4-cleft, tubular; corolla 4-petaled, ascending towards the upper side; stamens 8, seldom 6, declinate, the alternate ones a little shorter. Nut usually 1-celled, 1—4-seeded. Flowers spicate.

Gr. γαυρος, superb; on account of the noble spikes of rose-colored flowers. Cal. of a cylindric tube, much prolonged beyond the ovary. Cor. of 4 equal petals, with narrow claws inserted into the tube. Ova. oblong, of 4 cells, one only proving fruitful.

G. BIE'NNIS.

Leaves lanceolate, remotely-toothed; *spike* crowded; *petals* declinate, spreading; *styles* declinate. A beautiful biennial, with a profusion of rose-colored flowers. Stem 5 feet high, leafy, much branched. Leaves alternate, sessile. Flowers in dense, terminal clusters, very numerious, with a reddish calyx and petals at first white, becoming red. Grows on the dry banks of streams. August. *Biennial Gaura.*

4. LUDWI'GIA.

Calyx 4-parted, short, tubular; corolla 4-petaled; stamens 4, opposite the calyx lobes; style 1, short; capsule 4 celled, many-seeded.

Name in memory of C. D. Ludwig, professor of Botany at Leipsic, in the middle of the last century. Cal. lobes long, lanceolate, persistent. Pet. equal, obcordate, often minute or 0. Caps. short, perforated at top, crowned with the calyx.—Perennial herbs, in wet grounds. Leaves entire.

1. L. ALTERNIFO'LIA.

Erect, branched, nearly or quite smooth; *leaves* alternate, sessile, lanceolate, pale beneath; *peduncles* axillary, solitary, 1-flowered, 2-bracted above the middle; *petals* scarcely as large as the spreading, acuminate sepals; *capsule* large, with 4 winged angles, crowned with the colored calyx. Native of shady swamps. Stem 1--3 feet high, round, with a strong bark, and several branches. Leaves entire, with intermarginal veins, hoary beneath. Ovary square, with membranous angles. Sepals broad and large, often purplish within. Petals large, yellow and rather showy. Jl. Aug. *Seed-box.*

2. L. SPHŒROCA'RPA.

Erect, smooth or nearly so; *leaves* lanceolate, acute, attenuate at base; *flowers* axillary, subsolitary, on very short pedicels; *petals* minute or 0, as well as the bracteoles; *sepals* long as the small capsule. In water, partly submerged, or in very wet grounds. Leaves rough-edged, sometimes glandular denticulate. Stem somewhat angular, 2--3 feet high. Flowers greenish, inconspicuous. July--Sept.

3. L. PALU'STRIS. *Ell.* Isnardia palustris. *L.*

Prostrate, creeping, smooth and slightly succulent; *leaves* petioled, opposite, oval, attenuate at base; *flowers* sessile, axillary; *petals* 0, or very small. An obscure plant of no beauty, creeping in muddy places or floating in water. Stems a foot long, with many leaves and small, greenish flowers in their axils. Petals when present, flesh-colored. Jn.--Nov. *Water Purslane.*

5. CLA'RKIA.

Calyx 4-parted, deciduous; petals 4, unguiculate, 3-lobed or entire, the claws crowned with 2 minute teeth; stamens 8; style 1, filiform; stigma 4-lobed; capsule largest at base, 4-celled, 4-valved, many seeded.

Named in honor of General Clark, the companion of Lewis across the Rocky Mountains.

C. PULCHE'LLA.

Leaves linear-lanceolate; *petals* large, broad above, long-clawed, with three spreading lobes; *alternate stamens* abortive; *capsule* pedicillate. Corolla purplish, sometimes white. Native of Oregon. Cultivated in gardens, very pretty and of easy culture.

6. FU'CHSIA.

Calyx tubular-infundibuliform, colored, deciduous; petals 4, in the throat of the calyx, alternate with its segments; nectary an 8-furrowed gland; berry oblong, obtuse, 4-cornered.

Named in honor of Leonard Fuchs, an excellent German botanist of the 15th century. Shrubby plants, of great beauty.

F. MAGELLA'NICA.

Pedunceles axillary, 1-flowered; *leaves* in 3s, serrated. Native of Chili. A most delicate and beautiful green-house shrub, 1—6 feet high. The twigs and nerves of the leaves are tinged with red. The leaves are oblong-ovate, serrate, opposite or in whorls of 3. Flowers on long filiform peduncles, pendulous. The calyx is of 4 scarlet sepals united into a long tube, broad at the throat, much larger than the included, crimson or dark purple corolla. Stamens also red or scarlet, much exserted. Berry purple. Propagated by cuttings or slips, requiring careful attention. *Ladies' Ear-drop.*

TRIBE 2, CIRCÆEÆ.

Flower regular, its parts arranged in 2s.

7. CIRCÆA.

Calyx 2-sepaled, superior, deciduous; corolla 2-petaled, obcordate; stamens 2, opposite the sepals; carpels 2, united; style 1; capsule 2-celled, 2-seeded.

Name from *Circe*, because this plant was supposed to have been used by that enchantress.—Perennial herbs, with opposite leaves. Cal. adherent to the sides of the ovary and produced beyond it, the superior portion 2-parted, the segments oval, deflected. Pet. alternate with sep. and stam. Fil. filiform, long as calyx. Capsules obovate, hairy.

1. C. ALPI'NA.

Smooth; *stem* ascending, weak; *leaves* broad, heart-shaped, membranaceous, dentate, as long as the petioles; *bracts* setaceous. A small, delicate plant, often met with in low, wet or rocky woodlands in mountainous districts. The stem is prostrate, decumbent at base, less than a foot high. Leaves thin, shining, pale green, distinctly heart-shaped, acutely and irregularly toothed. The flowers are white, sometimes rose-color, in terminal and axillary racemes, appearing in July. *Alpine Enchanter's Nightshade.*

2. C. LUTETIA'NA.

Stem erect; *leaves* ovate, remotely dentate, opaque, pubescent. A larger plant than the preceding, growing in damp, shady woods and groves. Stem about 2 feet high, often more, erect, jointed, branched. Leaves opposite, dark green, often slightly cordate at base and acuminate at the apex. Flowers in long, terminal and lateral racemes, which continue to rise and blossom through June and July. Corolla tinged with red. Capsules inversely heart-shaped, rough-haired. *Enchanter's Nightshade.*

SUBORDER II, HOLORAGEÆ.

Plants small, aquatic, often apetalous. Seeds solitary.

8. PROSERPINA'CA.

Calyx 3-parted, superior; corolla 0; stamens 3; fruit 3-angled, 3-celled, crowned by a permanent calyx.

Lat. *Proserpina*, a Roman goddess; from some fancied resemblance; perhaps because the plant is partly concealed under the water, and partly above. The seed is a bony nut, 3-sided and 3-celled.

1. P. PALU'STRIS.

Leaves linear-lanceolate, sharply serrate above the water, those below pinnatifid. Native in ditches and wet grounds. Root creeping; stems a foot high, roundish, with alternate, narrow, petioled leaves, their serratures very acute. If growing in water, the immersed leaves are pinnatifid with linear segments. Flowers axillary, two or three together, succeeded by a very hard, bony, triangular nut. Jn. Jl. *Spear-leaved Mermaid-weed.*

2. P. PECTINA'CEA.

Leaves all pinnatifid in a pectinate manner. Found in pools and ditches. Considered by Michaux as *P. palustris.* Plants smaller than the preceding species, flowering in July and August. *Cut-leaved Mermaid-weed.*

9. MYRIOPHY'LLUM.

Flowers monœcious, or frequently perfect. *Sterile fl.*—Calyx 4-cleft; petals 4, caducous, frequently inconspicuous or 0; stamens 4, 6 or 8. *Fertile fl.*—Calyx 4-toothed; petals 4; stigmas 4, pubescent; styles 0; nuts 4, subglobose, 1-seeded.

Gr. μυριος, a myriad, and φυλλον, a leaf; from the infinite number of the divisions of the leaves.

1. M. SPICA'TUM.

Leaves pinnate, capillary; *spike* terminal, interrupted, leafless, bearing the flowers in whorls. A handsome aquatic, in deep water. Stem slender, branching, long and smooth. Leaves in whorls of 3 or 4, finely pectinate, with innumerable segments, always submerged. The spikes alone arise above the water, with small whorls of green, sessile flowers. Jl. Aug. Per. *Spiked Water-Milfoil.*

2. M. VERTICILLA'TUM.

Leaves pinnate, capillary, in whorls of about 3, upper ones pectinate-pinnatifid; *flowers* in axillary whorls, upper ones sterile, octandrous. In stagnant waters. Stem long, rather slender, floating, the upper extremity in air, with small green flowers. Jl. Per. *Water Milfoil.*

3. M. TENE'LLUM.

Erect, leafless; *bracts* entire, obtuse; *petals* linear, conduplicate and revolute. About the edges of ponds and rivers. Stems simple, 4--12 inches high, bearing only bracts and flowers. Flowers small, white, sessile, alternate, the upper ones sterile. July. Per.

4. M. HETEROPHY'LLUM.

Leaves in whorls of 5s, lower ones pinnately divided, with capillary segments, upper ones ovate-lanceolate, serrate, crowded. Stem thick, branching. Petals oblong. Ovary 2-ridged. In sluggish waters. June—Sept. Leaves very variable.

5. M. AMBI'GUUM.

Stem dichotomous, floating; *lower leaves* capillary, middle ones pectinate, upper ones nearly entire, all petioled; *flowers* mostly perfect; *carpels* smooth.

β. *limosum* (M. procumbens. *Bw.*); *stems* procumbent and rooting; *leaves*

all linear, rigid, nearly entire, or obsoletely toothed. A branching, erect or decumbent plant, in ponds and ditches, with alternate leaves and numerous purplish flowers.

10. HIPPU'RIS.

Calyx obsolete, entire; corolla 0; stamen 1; stigma simple; seed 1, inferior.

Gr. ἵππος, horse, οὐρα, tail. Cal. a mere rim crowning the ovary. Fil. superior, short. Anth. 2-lobed, compressed. Style longer than the stamen, in a groove of the anther. Seed naked.—Aquatic, perennial herbs.

H. VULGA'RIS.

Root creeping, with long, verticillate fibres; *stem* erect, simple, jointed; *flowers* axillary, sessile, solitary, often polygamous; *leaves* linear, acute, smooth, entire, in whorls of 8 or more. An aquatic plant, from 1 to 2 feet high. Its flowers are in their structure the simplest that are called perfect, consisting merely of 1 stamen, 1 pistil and 1 seed, without either calyx or corolla. Pools and slow waters. May. June. Per. Rare. *Mare's-tail.*

ORDER LVII. LOASACEÆ.

Cal.—Sepals united, 5, persistent, equal.
Cor.—Petals 5 or 10, cucullate, inserted into the recesses of the calyx.
Sta.—Indefinite, numerous, inserted with the petals, distinct or adhering in several sets.
Ova.—Adherent to the calyx more or less, 1-celled, with 3—5 parietal placentæ. *Style* 1.
Sds.—Many.

Herbaceous plants, with bristles or stinging hairs. Leaves without stipules. Flowers large. Natives of America, west of the Mississippi.

MENTZE'LIA.

Calyx tubular, 5-parted; petals 5—10, flat, spreading; stamens indefinite, 30—200; ovary inferior; styles 3, filiform, connate, and often spirally twisted; stigmas simple, minute; capsule 1-celled, many-seeded.

Beautiful flowering herbs, named in honor of Dr. Christian Mentzel, physician to the Elector of Brandenburg.

M. LI'NDLEYI. *T. & G.* Bartonia aurea. *Lind.*

Hispid; *leaves* ovate-lanceolate, pinnatifid; *lobes* often dentate; *flowers* solitary or nearly so, terminal; *petals* broadly obovate, very abruptly acuminate; *filaments* filiform, and, with the seeds, numerous. Native of California. Stems decumbent, branching, 1—3 feet in length, with golden yellow flowers 2—3 inches in diameter, the beauty of which is greatly heightened by the innumerable thread-like, yellow stamens. Ann. Cultivated. *Golden Bartonia.*

ORDER LIX. PASSIFLORACEÆ. *The Passion Flower Tribe.*

Cal.—Sepals 4—5, united below into a tube, the sides and throat of which are lined with a ring of filamentous processes, which appear to be metamorphosed petals.
Cor.—Petals 5, arising from the throat of the calyx outside the crown.

Sta.—5, monadelphous, surrounding the stipe of the ovary.
Ova.—Superior, on a long stipe, 1-celled. Styles 3.
Fr.—Stalked, within the calyx, many-seeded.

Herbaceous plants or shrubs, usually climbing. Leaves alternate, stipulate. Flowers large and showy, in axillary racemes. Natives of Tropical America, but cultivated in many other countries as ornamental flowers. The fruit of the Granadilla (Passiflora multiformis) is eaten in the W. Indies, and highly valued as a dessert, but the root is poisonous.

PASSIFLO'RA.

Calyx deeply 5-parted, colored; the throat with a complex crown of filiform rays; petals 5 or 0; fruit a pulpy berry.

Lat. *flos passionis*, because the several parts of the flower were supposed to represent the passion of Jesus Christ. The five stamens were compared to his five wounds; the three styles, to the three nails by which he was fixed to the cross; the column which elevates the ovary, to the cross itself, and the rays of the crown to the crown of thorns.

1. P. LU'TEA.

Leaves cordate, 3-lobed, obtuse, smooth; *petioles* without glands; *peduncles* axillary, in pairs; *petals* much narrower than the calyx. Native in Penn. and Vir. to Florida. Stem creeping, a few feet in length. The leaves are said to resemble those of the *Hepatica triloba*, both in shape and size, being smooth, glaucous and 3-lobed. Flowers with narrow petals, pale yellow. Crown of spreading rays of the same length and color as the petals. Sept. Per.

Yellow Passion-flower.

2. P. CÆRU'LIA.

Leaves palmate, 5-parted, entire; *petioles* glandular; *involucre* 3-leaved, entire; threads of *corona* shorter than the corolla. This is the tallest, most woody, and most admired species of this large and noble genus. Native of Brazil, where it grows to the size of a man's arm, and to the hight of 30 feet. It is tolerably hardy but requires protection from our frosts. It is cultivated either from cuttings, seeds or layers. The leaves are exceedingly elegant, smooth, glaucous, deeply palmate in 5 entire segments. Flowers blue outside, purple and white within, and continue but one day. Fruit ovate, yellow. "Among all the beauties which shine in sunny robes," says Hervey in his 'Reflections on a Flower Garden' "this, I think, has the noblest import if not the finest appearance. Were they all to pass in review, and expect the award of superiority from my decision, I should not hesitate a moment. While others appoint it a place in the parterre, I would transplant the Passion-flower, or rather its sacred signification to my heart. There let it bloom both in Summer and Winter, in the most expressive characters, and with undecaying lustre."

Common Passion-flower.

3. P. INCARNA'TA.

Leaves 3-lobed, serrate, lobes oblong, acute; *petioles* with 2 glands; *involuare* 3-leaved; threads of the *corona* longer than the corolla. This species is a native at the South, and next to the above, is perhaps the most popular in cultivation. The flower is rose color, variegated with purple, sweet-scented. Fruit the size of an apple, orange-colored. *Flesh-colored Passion-flower.*

4. P. MALIFO'RMIS.

Leaves oblong-ovate, cordate, 3-nerved, veiny, entire; *petioles* with 2-glands; *involucre* 3-leaved, larger than the flower. This is the *sweet calubush* of the W. Indies. It produces large flowers, red, white and blue, but of short dura-

tion. Fruit of the size and shape of a large apple, orange-colored when ripe, with a thick rind and sweetish pulp. It is served up in desserts.

Sweet Calabash. Granadilla.

ORDER LX. CUCURBITACEÆ. *The Gourd Tribe.*

Cal.—5-toothed. [marked with reticulated veins.
Cor.—Petals 5, united with each other and cohering to the calyx, very cellular, strongly
Sta.—5, distinct, more generally cohering in 3 sets. Anth. very long and wavy or twisted.
Ova.—Inferior, 1-celled, with 3 parietal placentæ often filling the cells.
Fr.—*A pepo* or membranous. Seeds flat, with no albumen, often ariled.

An order of succulent herbs, climbing by tendrils, with alternate, palmately veined, rough leaves. Flowers never blue, *monœcious* or *polygamous*. They are natives of tropical regions, only a few being found in the Temperate Zones of Europe and America. A highly important order of plants, affording some of the most delicious and nutritive of fruits. A bitter, laxative principle pervades the group, which is so concentrated in a few as to render them actively medicinal. The officinal *colocynth* is prepared from the pulp of Cucumis Colocynthis, a powerful drastic poison.

Conspectus of the Genera.

Fruit	a fleshy pepo, many-seeded,	indehiscent;	Seeds thin at edge,	*Cucumis* 4
			Seeds thick at edge,	*Cucurbita.* 5
		dehiscing elastically,	. . . .	*Momordica.* 3
	membranaceous,	4-seeded,	. . . . .	*Echinocystis.*2
		1-seeded,	. . . . .	*Sicyos.* 1

1. SI'CYOS.

Flowers monœcious. *Sterile flowers*—Calyx 5-toothed; corolla 5-parted; filaments 3. *Fertile fl.*—Calyx 5-toothed; corolla 5-parted; styles 3-cleft; fruit ovate, hispid, or echinate; seed large, compressed.

Gr. σικχος, unpleasant, for such is certainly the taste of the *single seeded cucumber.*

S. ANGULA'TA.

Leaves cordate, with an obtuse sinus, 5-angled, denticulate, rough. Native on river banks. A week, climbing vine, with long, spiral, branching tendrils. Stem branching, hairy. Leaves 3 or 4 inches broad, alternate, on long stalks. Flowers axillary, whitish, marked with green lines, the barren ones on long, racemose peduncles. Fruit half an inch long, ovate, spinous, 8—10 together in a round head, and each with one large, ovate seed. July. Ann.

Single seed cucumber.

2. ECHINOCY'STIS.

Flowers monœcious. *Sterile fl.*—Calyx of 6 filiform-subulate segments, shorter than the corolla; petals 6, united at base into a rotate-campanulate corolla; stamens 3, diadelphous. *Fertile fl.*—Cal. and cor. as above; abortive fil. 3, distinct, minute; style very short; stig. 2, large; fruit roundish, inflated, echinate. Annual, climbing.

E. LOBA'TA. *T. & G.* Momordica echinata. *Muh.* Sicyos lobata. *Mx.*

Fruit roundish, setose-echinate, with 4 seeds; *leaves* cordate, with 5 angular lobes, acuminate, sub-entire; *calyx* 6-cleft. A running vine, rarely found

in N. England and the Middle States. The stem is smooth, deeply furrowed, with long, divided tendrils, placed mostly opposite to the long leaf-stalks. Flowers white, small, the barren ones very numerous, in axillary panicles. Fertile ones solitary, situated at the base of the panicle. Fruit small. Aug. Annual. *Bristly Balsam-apple.*

3. MOMO'RDICA.

Flowers monœcious. *Sterele fl.*—Calyx 5—6-cleft; corolla 5—6-parted; filaments 3. *Fertile fl.*—Calyx and corolla as above; style 3-cleft; berry bursting elastically; seeds compressed.

Lat. *mordeo, momordi*, to chew; from the appearance of the seeds, the rough surface of which appears as if chewed.

M. BALSAMI'NA.

Fruit roundish-ovate, angular, tuberculate; *leaves* palmate, spreading, smooth. An annual, tender plant from E. India. Fruit orange-colored, as large as a goose egg, splitting elastically on one side and discharging the seeds. The fruit has been considered a good vulnerary. *Common Balsam-apple.*

4. CU'CUMIS.

Flowers monœcious. *Sterile fl.*—Calyx 5-toothed, campanulate; corolla 5-parted; filaments 5, in 3 sets. *Fertile fl.*—Calyx 5-toothed; corolla 5-parted; ovary 3-fid; fruit (*pepo*) with sharp-edged seeds.

Said to be derived from the Celtic *cuce*, a hollow thing; a term more applicable to the gourd than to the *cucumber.*

1. C. SATI'VUS.

Angles of the leaves straight; *fruit* an oblong, prickly, pome-like berry. The cucumber is a native of Asia, whence it was brought to England in 1573. *Cucumber.*

2. C. MELO.

Angles of the leaves rounded; *fruit* oblong, torulose. First cultivated in England in 1570. *Muskmelon.*

3. C. ANGUI'NIS.

Leaves lobed; *fruit* cylindric, very long, smooth, contorted and folded upon itself. From the East Indies. *Serpent Cucumber.*

4. C. COLOCY'NTHIS.

Leaves many-cleft; *fruit* globose, smooth. From Cape Good Hope. The fruit of the colycinth is about the size, form and color of the orange, with an intolerably bitter pulp. The extract is the colycinth of the shops, an acrid poison, but with other substances is a useful cathartic. *Colycinth.*

5. C. ANGU'RIA.

Leaves palmate-sinuate; *fruit* globose, echinate. Native of Jamaica. *Prickly Cucumber.*

5. CUCU'RBITA.

Flowers monœcious. *Sterile fl.*—Calyx 5-toothed; corolla 5-fid, filaments 5, in 3 sets. *Fertile fl.*—Calyx 5-toothed; corolla 5-fid; ovary 3-fid; fruit (*pepo*) with seeds thickened at the margin.

This is a Latin word of the same origin as cucumis, and signifies a vessel, in allusion to the well known use of the gourd.

1. C. LAGENA'RIA.

Leaves cordate, roundish-obtuse, pubescent, denticulate, with 2 glands beneath at the base; *fruit* clavate, somewhat woody. From India. Flowers white. *Calabash. Bottle-gourd.*

2. C. PEPO.

Leaves cordate, obtuse, about 5-lobed, denticulate; *fruit* roundish or oblong, smooth. The pumpkin (more properly pompion) is from the Levant. *Pumpkin.*

3. C. CITRU'LLUS.

Leaves 5-lobed, lobes sinuate, pinnatifid, obtuse; *fruit* elliptical, smooth. From S. Europe. *Water-melon.*

4. C. OVI'FERA.

Leaves cordate, angular, 5-lobed, denticulate, downy; *fruit* obovate, striped with lines lengthwise. Native of Astrecan. *Egg Squash.*

5. C. VERRUCO'SA.

Leaves cordate, deeply 5-lobed, the middle lobe narrowed at base; *fruit* clavate, verrucose. Native country unknown. *Club Squash.*

6. C. MELOPE'PO.

Leaves cordate, obtuse, about 5-lobed, denticulate; *fruit* large, torulose tumid at the margin. Native country unknown. *Flat Squash.*

ORDER LXI. GROSSULACEÆ. *The Gooseberry Tribe.*

Cal.—Superior, 4—5-cleft, regular, colored, marcescent, imbricate in æstivation.
Cor.—Petals inserted in the throat of the calyx, small, distinct, as many as sepals.
Sta.—As many as petals and alternate with them, very short; *anthers* introrse.
Ova.—One-celled, with 2 parietal placentæ; *ovules* numerous; *styles* 2.
Fr.—A 1-celled berry (the cell filled with pulp) crowned with the remains of the flower.
Sds.—Anatropous, the embryo minute, radicle next the micropyle.

A small order of shrubs either spiny or unarmed, with alternate-lobed leaves. Flowers in axillary racemes. The gooseberries and currents are natives of the N. temperate zone of both continents, but unknown in the tropics or S. hemisphere, except S. America.

Properties.—The berries contain a sweet, mucilaginous pulp, together with malic or citric acid. They are always wholesome and usually esculent.

RIBES.

Character the same as that of the Order.

An Arabic name of uncertain etymology, applied to the Rheum ribes.

* *Stems unarmed.* CURRANTS.

1. R. FLO'RIDUM.

Leaves punctate on both sides with resinous dots; *racemes* pendant, pubescent; *calyx* cylindric; *bracts* longer than the pedicels. A handsome shrub, in woods and hedges, common. Hight 3—4 feet. Leaves about 5-lobed, toothed, the dots whitish. Calyx somewhat bell-shaped. Petals greenish yellow, rather large. Fruit black, insipid. May. *Wild Black Currant.*

2. R. RUBRUM.

Racemes glabrous, nodding; *flowers* flattish; *petals* obcordate; *leaves* obtusely 5-lobed. The common red currant is said to grow wild in Canada and thence to Mackenzie River. Its culture and uses are known to every body. The variety *album*, the white currant, has yellow berries, larger and less tart than the *rubrum*. Propagated from cuttings of last year's growth. May.

3. R. PROSTRA'TUM. *L'Her.* R. rigens. *Mx.*

Leaves smooth, cordate, lobed and doubly serrate, reticulate-rugose, pubescent beneath; *racemes* erect, lax, many-flowered; *berries* glandular hispid A small shrub, with ill-flavored berries, on mountains and rocky hills. Stem with straight branches. Leaves 5—7-lobed, on long petioles. Racemes about 8-flowered, becoming erect in fruit. Berry red, rather large. Flowers marked with purple. May. *Mountain Currant.*

4. R. NIGRUM.

Leaves punctate beneath; *racemes* lax; *flowers* campanulate; *bracts* shorter than pedicels; *berries* black. Exotic. The culture of the black currant is similar to the red. This species much resembles R. floridum, and may be but a cultivated variety. May. *Black Currant.*

5. R. AU'REUM.

Very smooth; *leaves* 3-lobed, lobes spreading, with a few teeth; *bracts* linear, as long as the flower-stalks; *berries* smooth. Native of Missouri. A very beautiful species, about 8 feet high, cultivated in gardens as an ornamental shrub. Petiole ciliate at base, longer than the leaves. Racemes lax, with numerous, yellow, very fragrant flowers. Calyx tubular longer than the pedicels, divisions oblong, obtuse. Petals linear, half as long as the divisions of the calyx. April. May. *Missouri or Golden Currant.*

* * *Stems prickly.* GOOSEBERRIES.

6. R. CYNO'SBATI.

Spines sub-axillary, about in pairs; *leaves* lobed, cut and toothed, downy; *racemes* nodding, few-flowered; *calyx* erect, campanulate; *berries* prickly. A handsome shrub, about 4 feet high, found in hedges and thickets. Thorns from 1 to 3, near the axils of the leaves. Leaves in 3—5 gash-toothed lobes. Flowers green. Berry covered with long prickles, and of a dull brown color. June.

7. R. ROTUNDIFO'LIUM. *Mx.* R. triflorum. *L.*

Spines sub-axillary, short; *leaves* smooth, 3—5-lobed, incisely dentate; *pedunclcs* 1—3-flowered; *pedicels* elongated; *petals* spathulate, unguiculate; *stamens* exserted, smooth, much longer than the petals; *style* hairy, exserted, deeply 2—3-cleft; *berries* smooth. A bushy shrub, 3—4 feet high, with fruit similar to the common gooseberry. Grows in woods. Petioles and the under side of the leaves pubescent. Petals white. Berry red. May. *Wild Gooseberry.*

8. R. LACU'STRIS.

Sub-axillary *spines; stems* aculeate, hispid; *leaves* lobed beyond the middle; *petioles* villous; *berries* racemose, hispid. A handsome shrub, 4 feet high, found in woods. The younger stems are rough all over with bristles; the older ones smooth, with a few spines near the axils of the leaves. Flowers green, 6—10 in each raceme. Fruit covered with long prickles. May.

Swamp Gooseberry.

9. R. HIRTE'LLUM. *Mx.* R. triflorum. *B.*

Sub-axillary *spines* solitary or nearly so, short; *leaves* pubescent beneath, roundish, cordate at base, 3—5-lobed; *flowers* generally solitary, nodding; *calyx* longer than the petals; *stamens* longer than either; *style* hairy, 2-cleft; *fruit* smooth. In rocky woods. Flowers greenish. Fruit purple. Leaves small, generally 3-cleft to the middle. May.

10. R. GROSSU'LARIA.

Petioles hairy; *peduncles* 1-flowered; *bracts* 2; *fruit* hairy. The common garden Gooseberry is native of England, where it is cultivated to such a degree of perfection that a single berry often weighs an ounce. The variety *Uva-crispa*, has connate-tubular bracts, and fruit without hairs. Apr.

English Gooseberry.

ORDER LXII. CACTACEÆ. *The Cactus Tribe.*

Cal.— } Sepals and petals numerous, often indefinite and confounded with each other, the
Cor.— } sepals from the surface and the petals from the summit of ovary.
Sta.—Indefinite. *Fil.* long and filiform. *Anth.* ovate, versatile.
Ova.—Inferior, fleshy, 1-celled, with parietal placentæ.
Sty.—Single, filiform, with several anthers in a star-like cluster.
Fr.—Succulent, 1-celled, many-seeded.
Sds.—Without albumen, with thick foliaceous cotyledons, or often, with scarcely any.

An order of succulent plants, very variable in form and aspect, usually of a shrubby habit, with spinose buds, and leafless. The stems are either globular masses, or columnar with angles, or flattened into a leafy form with articulations. Flowers solitary, sessile, generally large and showy, but of brief duration.

All the genera are peculiarly American, no one having ever been found in any other quarter of the globe. They are chiefly confined within the tropics, only two or three species having been found beyond them. The Prickly Pear (Opuntia vulgaris) is the only species found native as far north as New York.

OPU'NTIA.

Sepals and petals numerous, adnate to the ovary; stamens numerous; style with numerous, thick, erect stigmas; berry tuberculate.

Named from Opuntiani, a country near Phocis, where this plant appears to have been naturalized. Shrubby plants, with articulated branches, the joints usually broad and flattened, with fascicles of prickles regularly arranged upon the surface.

1. O. VULGA'RIS. *Dc.* Cactus Opuntia. *L.*

Proliferous; *articulations* compressed, ovate; *spines* fasciculate. A well known, succulent plant, found wild in rocky mountains and sandy fields, N. Y. and Conn. It is often cultivated, as well for the singularity of its form, as the elegance of its flowers. Like the other species of the genus, it appears like a series of thick, fleshy leaves, growing from the tip or sides of each oth-

er, and covered with clusters of prickles. The flowers come forth from the edge of the joints or internodes, are large, yellow, followed by a smooth, crimson, eatable fruit. *Prickly Pear.*

2. O. PHYLLAN'THUS. *Dc.* Cactus phyllanthus. *L.*

Proliferous; *branches* ensiform, compressed, serrate, with a central, woody rib. From S. America. A species of remarkable form. The articulations of the stem are 2 or more feet long and about 2 inches wide, weak, bordered with large, rounded serratures, and traversed lengthwise by a thick, cylindrical nerve. Flowers very large, pink-colored, growing from the indentures of the stem. *Spleenwort.*

3. O. PHYLLANTHOI'DES. *Dc.* Cactus phyllanthoides. *L.*

Branches ensiform, compressed, obovate, with spreading, rounded teeth; *spines* few, setaceous, slender, longer than the wooly covering. From Jamaica. A splendid flowerer, with leaf-like, fleshy joints, each 6—10 inches long, and 1—2 wide. Flowers very large, from the summit or notches of the joints. Sepals and petals pink-colored, lanceolate, several inches in length.

4. O. TRUNCA'TUS. *Dc.* Cactus truncatus. *L.*

Branching; *articulations* short, compressed (leaf-like), serrate, truncate at the summit. From Brazil. A very distinct species, growing a foot high. Flowers with reflexed, pink-colored petals. *Truncate Cactus.*

2. CE'REUS.

Sepals and petals very numerous, imbricated and adnate to the base of the ovary, the outer shorter, the inner petaloid; stamens numerous; style filiform, with many stigmas; berry scaly with the remains of the sepals.

Fleshy shrubs, with long, cylindrical, furrowed axes, armed with fascicles of spines. Flowers from the clusters of spines.

1. C. GRANDIFLO'RUS. Cactus grandiflorus. *L.*

Stems creeping, rooting, with about five angles. Native of the W. Indies. Stems cylindric or prismatic, branching, the angles not very prominent. Spines small, clustered. The flowers, which endure but a few hours, are lateral, 6 inches to a foot in diameter, very fragrant. Sepals brown without, yellow within. Petals of a pure white. It is cultivated in the hot house, and may be trained against the wall. Much care is requisite, but no flowering plant better repays the labor of its culture. *Night-blooming Cereus.*

2. C. FLAGELIFO'RMIS. Cactus flageliformis. *L.*

Stem creeping, with about 10 angles, hispid. Native of S. America. Stem about the size of the little finger, cylindric, channelled, 3—5 feet long. Flowers lateral, sessile, of a lively pink-color, smaller but more numerous than those of the preceding species, and continuing in bloom several days. *Snake Cereus or Cactus.*

3. C. TRIANGULA'RIS. Cactus triangularis. *L.*

Stem creeping, triangular. Native of W. Indies. Stem long, and in its native country, climbing trees, and supporting itself with lateral roots. Flowers very large, white, lateral solitary. Fruit ovate, both sweet and acid, pleasant and cooling, much esteemed in the W. Indies. *Strawberry Pear.*

These are the more common or favorite species, but many others are occasionally reared in the parlor or the green-house,—so many that it would transcend our limits to notice them individually. The cultivation of the Cacti, which is rapidly becoming a popular amusement, is nearly the same for all the species. The cuttings should be left for several days, or even weeks, exposed to the air until they are shrivled. If then potted, they root immediately. The pots should be small, and well drained with fragments of earthern or brick at the bottom. The best soil is sandy loam, or loam mixed with gravel. They require but little water, and a free, open air, when the temperature will allow it.

ORDER LXIII. MESEMBRYANTHEMACEÆ. *Ice-plant Tribe.*

Cal.—Sepals varying from 4 to 8, but usually 5, somewhat connected at base.
Cor.—Petals indefinite, colored, in many rows.
Sta.—Indefinite, distinct, arising from the calyx.
Ova.—Inferior or nearly superior, many-celled. *Stigmas* numerous.
Caps.—Many-celled, opening in a stellate manner at the apex.
Sds.—More commonly indefinite, attached to the inner angle of the cells.

The greater part of the plants of this order are natives of the hot, sandy plains of the Cape of Good Hope. A few are found in S. Europe, N. Africa, &c., and only one genus, Sesuvium, along the sea shore of the Middle and Southern States.

MESEMBRYA'NTHEMUM.

Calyx 5-cleft; petals many, linear; capsule fleshy, turbinate, inferior, many-seeded.

Gr. μεσημβρια, the mid-day, ανθος, flower; because the plants open their flowers about that time. Exotic. Mostly herbs, thick and fleshy.

1. M. CRYSTALLI'NUM.

Leaves large, ovate, acute, wavy, frosted, 3-nerved beneath; *root* biennial. A popular house plant, from Greece. It has a creeping stem a foot or more in length, which, together with the leaves, is covered over with numerous, frosty, warty protuberances, giving the plant a very singular aspect. Flowers white, appearing all summer. *Ice-plant.*

2. M. CORDIFO'LIUM.

Leaves petiolate, cordate-ovate; *stems* procumbent, spreading; *calyx* 4-cleft, 2-horned. An interesting little plant, well known in *house* cultivation, native of Cape Good Hope. The whole plant fleshy and succulent like others of its kind. Flowers pink-colored. Calyx thick, green, the horns opposite. Capsule translucent, marked on the summit with cruciform lines.
Heart-leaved Ice-plant.

The numerous species of this extensive genus, says Loudon, are singular yet beautiful, and some even splendid plants. Their leaves are of odd shapes, and the habits of most are slovenly and insignificant, though some are grotesque. But the flowers make ample amends by their profusion, brilliancy of color and the length of time they continue in bloom. Few are annual, fewer biennial, many perennial, but most are shrubby, especially at base. Leaves mostly opposite, thick or succulent, of various forms. Flowers solitary, axillary, supra-axillary, and more frequently terminal. The hardy sorts will grow in the open air if protected during winter.

ORDER LXV. CRASSULACEÆ. *The Crassula Tribe.*

Cal.—Sepals 3—20, more or less united at base, persistent.
Cor.—Petals as many as the sepals, distinct, rarely cohering.
Sta.—As many as the petals and alternate with them, or twice as many.
Ova.—As many as the petals and opposite them. Fil. distinct. Anth. 2-celled, bursting lengthwise.
Fr.—Follicles as many as the ovaries, each opening by the ventral suture, many-seeded.

A family of herbs and shrubs, all (except Penthorum) remarkable for their succulent stems and leaves, chiefly natives of the warmer regions of the globe, particularly the Cape of Good Hope. About 20 are found in North America. They grow in the thinnest and dryest soil, on naked rocks, sandy deserts, &c. They have no remarkable properties except a slight acridity. Many are highly ornamental.

Conspectus of the Genera.

Floral organs arranged	in 4s;	Stamens 1,	*Tillæa.* 1
		Stamens 8,	*Bryophyllum.* 5
	in 5s; stamens 10;	Carpels distinct,	*Sedum.* 2
		Carpels united,	*Penthorum.* 4
	in 12s,		*Sempervivum.* 3

TRIBE 1, CRASSULEÆ. *Carpels distinct, follicular.*

1. TILLÆ'A.

Calyx of 3—4 sepals united at base; petals 3—4, equal; stamens 3—4; capsules 3—4, follicular, opening by the inner suture, 2 or many-seeded.

In memory of Mich. Ang. Tilli, an Italian botanist; died 1740.—Very minute, annual, aquatic herbs. Leaves opposite.

T. SIMPLEX. *Nutt.* T. ascendens. *Eaton.*

Stem ascending or erect, rooting at the lower joints; *leaves* connate at the base, linear-subulate, fleshy; *flowers* axillary, solitary, sessile. A very small plant, on the muddy banks of streams. Stem 1—3 inches high. Flowers white or greenish; petals oval, flat, acute, twice as long as the oval minute calyx, and longer than the stamens and fruit. *Pigmy-weed.*

2. SEDUM.

Calyx of 4—5 sepals united at base; petals 4—5, distinct; stamens 8—10; a nectariferous scale at the base of each of the 4—5 carpels.

Lat. *sedere*, to sit; the plants growing on bare rocks look as if sitting there. —Mostly herbaceous. Inflorescence cymose.

1. S. TERNA'TUM.

Leaves ternately verticillate, flat, obovate, entire, smooth, the upper ones scattered, sessile, lanceolate; *cyme* in about 3 divisions; *flowers* secund. A small, creeping plant, with a 3-forked spike of white flowers. Stems 6 inches long, branched and decumbent at the base. Flowers with 8 stamens, the other parts in 4s. July. Aug. Per. *Stone-crop.*

2. S. TELEPHOI'DES.

Leaves broadly-lanceolate, alternate at base, subdentate, smooth; *cymes* dense, corymbose; *stamens* 10, the sepals, petals and carpels in 5s. Found on the shores of Seneca Lake, &c. Stem a foot high, with numerous, purple flowers in a terminal, branching cyme. Jl. Per.

3. S. ANACA'MPSEROS.

Leaves wedge-shaped, alternate at base, subsessile; *stems* decumbent; *flowers* in corymbose cymes. Native of France, growing there in the crevices of rocks. Root fibrous. Stems reddish and decumbent at base, erect and glaucous above. Leaves fleshy, of a bluish green. Flowers purple, in leafy, terminal tufts. July. Cultivated. Per. *Evergreen Stone-crop.*

4. S. TELE'PHIUM.

Leaves flattish, serrate, scattered; *root* tuberous, fleshy, white; *stems* two feet high, erect; *corymbose cyme* leafy. Native of Europe. Cultivated. Stems simple, leafy, round, smooth, purplish. Leaves sessile, ovate, fleshy, tooth-serrate. Flowers purple or white, in dense, terminal, leafy tufts. Aug. Per. This plant much resembles *S. telephoides.* *Common Orpine. Live-forever.*

3. SEMPERVI'VUM.

Calyx of 12 united sepals; corolla of 12 petals; capsules 12, many-seeded.

Lat. *semper vivere,* to live forever; in allusion to the tenacity of life which distinguishes these plants. Succulent herbs or shrubs, all exotic, some of which are ornamental.

1. S. ARBO'REUM.

Stem arborescent, smooth, branched; *leaves* cuniform, smoothish, bordered with soft, spreading ciliæ. A curious and ornamental plant, from the Levant. Stem very thick and fleshy, branching into a tree-like form, 8—10 feet high. Flowers yellow. Evergreen. *Tree House-leek.*

2. S. TECTO'RUM.

Leaves ciliate; *bulbs* spreading; *nectaries* cuniform, crenulate. Native of Britain. This plant is remarkable for the anthers bearing ovules instead of pollen. *Lindley.* *Common House-leek.*

3. S. TABULÆFO'RME.

Leaves closely packed together in a broad, flat disk. Native of Teneriffe. *Tabular House-leek.*

TRIBE II, DIAMORPHEÆ. *Carpels united.*

4. PENTHO'RUM.

Calyx of 5 sepals united at base; petals 5 or 0; stamens 10; capsules of 5 united carpels, 5-angled, 5-celled and 5-pointed.

Gr. πεντε, five; on account of the 5-marked angles of the capsule.—An erect, perennial herb, of little beauty.

P. SEDOI'DES.

Stem branched, angular above; *leaves* nearly sessile, unequally serrate, lanceolate; *cyme* of panicled, simple, secund spikes. The only American species of the genus. A hardy perennial, of moist situations. Stem a foot or more in hight, its opposite angles fringed with minute hairs slightly branched.

Leaves alternate, acute, smooth, green on both sides. Spikes several, terminal, recurved, with one-sided flowers, forming a sort of corymbose cyme. Flowers greenish yellow, scentless, appearing in July. *Virginian Stone-crop.*

5. BRYOPHY'LLUM.

Sepals 4; petals 4, connate into a cylinder; seeds many.

Gr. βρυω, to grow, φυλλον, a leaf; if the leaves are laid upon damp earth they put forth roots from their notches, whence proceed young plants.

B. CALYCI'NUM.

Leaves oval, crenate; *flowers* long, pendulous, cylindrical. April—July. A stout, fleshy plant, from E. India. In growing, it requires but very little water, and the pot should be kept well drained.

ORDER LXVI. SAXIFRAGACEÆ. *The Saxifrage Tribe.*

Cal.—Sepals 4 or 5, cohering more or less, persistent.
Cor.—Petals as many as the sepals, inserted between the lobes of the calyx.
Sta.—5—10. *Anthers* 3-celled, opening longitudinally.
Ova.—Inferior, usually of 2 carpels, cohering at base, distinct and divergent above.
Fr.—Generally capsular, 1—2-celled, many-seeded.

Herbs and shrubs, small, but of elegant structure, native of temperate and frigid climes in both continents. As a tribe, their roots are astringent. Several species are among our most ornamental, cultivated plants.

Conspectus of the Genera.

Herbs;	entire; stamens 5,	*Heuchera.*	2
	petals 5, pectinately pinnatifid,	*Mitella.*	5
	Petals none. Aquatic; depressed; leaves opposite,	*Crysosplenium.*	3
	Petals (not sepals) valvate in æstivation,	*Hydrangea.*	6
Shrubs;	Petals convolute in æstivation,	*Philadelphus.*	7
Herbs;	stamens 10, not much exserted,	*Saxifraga.*	1
	stamens 10, manifestly exserted,	*Tiarella.*	4

SUBORDER I, SAXIFRAGEÆ.

Petals imbricate in æstivation; carpels united, the summits distinct, forming a beaked capsule. HERBS.

1. SAXIFRA'GA.

Calyx of 5 sepals, more or less united; corolla 5-petaled, entire; capsule 2-beaked, 2-celled, opening between the diverging beaks; seeds many.

Lat. *saxum*, a stone, and *frangere*, to break; from its medicinal properties. Cal. about half-inferior. Pet. spreading, narrow at base, attached to the cal. Anth. 2-lobed, roundish, with a longitudinal dehiscence. Ova. ending in 2 short, spreading styles.—Perennial herbs.

1. S. VIRGINIE'NSIS.

Leaves mostly radical, cuniform-obovate, somewhat toothed, pubescent, shorter than the stalk; *stem* paniculate above. An interesting little plant, blossoming in early spring, and growing mostly upon dry, rocky soil. Stem erect, pubescent, about half a foot high, bearing at top a panicle of numerous white flowers. Leaves fleshy, tapering at base into the petioles.

Early Saxifrage.

2. S. PENNSYLVA'NICA.

Leaves oblong-lanceolate, hairy, denticulate; *stem* naked; *peduncles* alternate, with close cymes, forming a diffuse panicle. A common plant, much larger than the foregoing, growing in wet meadows. Leaves all radical, large and fleshy, pale green, 5—8 inches long, tapering into the petiole. Scape 2—3 feet high, gross, hollow, hairy and viscid, erect, with greenish yellow flowers without beauty. May. *Pennsylvanian Saxifrage.*

2. HEU'CHERA.

Calyx 5-cleft, the segments obtuse; corolla inferior, of 5 small petals inserted into the margin of the calyx; capsule 2-beaked, 2-celled, many-seeded.

Named for Heucher, professor of medicine at Wirtemberg, Germany, and a botanic author.—Perennial herbs, with radical leaves.

H. AMERICA'NA.

Viscid-pubescent; *scape* and *leaves* roughish; *leaves* with roundish lobes, dentate; *teeth* dilated, mucronate; *panicle* dichotomous; *calyx* short, obtuse; *petals* as long as the calyx, spathulate; *stamens* much exserted. Grows in rocky shades. A neat plant, with radical leaves on long petioles, and a scape 2 feet long, bearing a long, forked panicle of purple flowers. Jn. Jl. Per.—The root is astringent, hence the plant is called *Alum-root.*

3. CHRYSOSPLE'NIUM.

Calyx lobes 4—5, colored within; petals 0; stamens 8—10; capsule 2-beaked or lobed at the summit, 2-valved, one-celled, many-seeded.

Gr. χρυσος, gold, and σπλην, the spleen; on account of its medicinal qualities. Cal. very short, of 4 oval seg., the opposite ones narrower. Fil. very short. Ova. half-inferior, ending in 2 awl-shaped styles, the length of the stamens.—Small, aquatic herbs.

C. AMERICA'NUM. C. oppositifolium.

Leaves opposite, roundish, slightly crenate, tapering to the petiole. A small plant, in springs and streams, spreading upon the muddy surface. Stem square, 3—6 inches long, divided in a dichotomous manner at top. Leaves opposite, half an inch in length, smooth. Calyx 4-cleft, greenish yellow with purple lines. Corolla 0. Stamens 8, very short, with orange-colored anthers, which are the only conspicuous part of the flower. The terminal flower is sometimes decandrous. Apr. May. *Golden Saxifrage.*

4. TIARE'LLA.

Calyx 5-parted, the lobes obtuse; petals 5, entire, the claws inserted on the calyx; stamens 10; capsule 1-celled, 2-valved, one valve larger.

Lat. *tiara*, a mitre or some other head-dress; from the resemblance of the capsule. Cal. segments valvate in æstivation, deep, ovate, acute. Stamens longer than cor., inserted into the cal. Ova. cloven, ending in 2 very short styles.—Perennial herbs.

T. CORDIFO'LIA.

Leaves cordate, acutely lobed, toothed; *teeth* mucronate; *scape* racemose; *stolons* creeping. A common plant in the woods of N. H., where it is often associated with the *Mitella diphylla*, which plant in its general aspect, it much resembles. The scape arises from creeping root-stalks about 10 inches high, often bearing a leaf. Leaves hairy, on long, hairy petioles. Flowers in an elongated raceme, entirely white, with minute bracts. May. Jn.
Heart-leaved Tiarella.

5. MITE'LLA.

Calyx 5-cleft; petals 5, pinnatifid, inserted on the calyx; stamens 5 or 10; capsule 1-celled, with 2 equal valves.

Lat. *mitra*, a mitre, so named for the same reason as the last genus, which it much resembles both in appearance and habits. Cal. inferior, campanulate, cleft half down. Pet. twice as long as the cal. each in many capillary seg. Fil. shorter than cor. Styles very short.—Perennial herbs.

1. M. DIPHY'LLA.

Leaves cordate, sublobate, toothed; *stem* 2-leaved. Very common in N. England, and frequenting the same situations as the foregoing. The stem arises a foot or more, bearing near the midst, two opposite, ovate, lobed and toothed leaves. Radical leaves hairy, on long, hairy petioles. Flowers on short pedicels, arranged in a long, terminal, thin spike, and most beautifully distinguished by the pectinately pinnatifid white petals. Seeds black, shining. Woods. May. June. *Two-leaved Mitella.*

2. M. NUDA. *L.* M. prostrata. *Mx.* M. cordifolia. *Lam.*

Leaves orbiculate reniform, doubly crenate, with scattered hairs above; *scape* filiform, few-flowered, naked or with a single leaf; *petals* pinnatifid with filiform segments. A very delicate species, growing in damp, rich, shady woodlands at Potsdam, N. Y., and in Northern N. Eng. Leaves and stems light green, pellucid. Scape 4—6 inches high, terminating in a thin raceme of white flowers, with finely pinnatifid petals. They are erect or prostrate, and send out creeping stolons from the base. Leaves $\frac{3}{4}$ inch long and of nearly the same width. June. *Dwarf Mitella.*

SUBORDER II, HYDRANGEÆ.

Petals valvate in æstivation. Capsules 2-celled. Leaves opposite and without stipules. SHRUBS.

6. HYDRA'NGEA.

Calyx 4—5-toothed, hemispherical, persistent; petals ovate, sessile; stamens twice as many as petals; capsule 2-beaked, opening by a foramen between the beaks. Marginal flowers commonly sterile, with a flat, 4 or 5-cleft, broad, colored calyx.

Gr. ὕδωρ, water, αγγιον, a vessel; because the cultivated species require so copious a supply of water. Petals, stamens and pistils in the barren flowers, either rudimentary or 0.

1. H. ARBORES'CENS.

Leaves ovate, obtuse or cordate at base, acuminate, dentate, smooth; *flowers* in fastigiate cymes. An elegant shrub, common in the Middle States, and cultivated in the Northern, attaining the hight of 5—6 feet on its native shady banks. Flowers small, white, becoming rose-colored, very numerous, mostly radiate. July. Aug. *Common Hydrangea.*

2. H. QUERCIFO'LIA.

Cymes radiate; *leaves* oblong, sinuate, lobed, dentate, tomentose beneath. A beautiful shrub, with very large and numerous sterile flowers. Native of Florida, cultivated in gardens. Leaves very large. Flowers becoming reddish. *Oak-leaved Hydrangea.*

3. H. HORTE'NSIS.

Cymes radiate; *leaves* elliptical, narrowed at each end, dentate, smooth. A well known cultivated plant, probably native of China, where it has long been cultivated in gardens. It produces a great profusion of very elegant flowers, which, at first green, pass successively through straw-color, sulphur-yellow, yellow, white, blush-color and pink; but, although mostly complete, they are barren like those of the snow-ball (Viburnum Opulus). By certain kinds of culture, soil, &c. they become blue. It is to be reared in large pots and supplied with an abundance of water. Peat mixed with loam is said to change the hue of the flowers. *Changeable Hydrangea.*

SUBORDER III, PHILADELPHEÆ.

Petals convolute in æstivation. Capsule 3—4-celled, loculicidal. SHRUBS.

7. PHILADE'LPHUS.

Calyx 4—5-parted, half-superior, persistent; corolla 4—5-petaled; style 4-cleft; stamens 20—40, shorter than the petals; capsule 4-celled, 4-valved, with loculicidal dehiscence; seeds many, arilled.

A name used by Athenæus for a tree now unknown.—Handsome flowering shrubs. Leaves opposite, exstipulate.

1. P. GRANDIFLO'RUS. *P.* P. inodorus. *Mx.*

Leaves ovate, acuminate, denticulate, 3-nerved, axils of the veins hairy; *stigmas* 4, linear; *style* undivided. A very showy shrub, 6 feet high, native at the South, cultivated in shrubberies. Branches smooth, long and slender. Flowers large, in a terminal umbel of 2 or 3, white, nearly inodorous. Calyx divisions conspicuously acuminate, and much longer than the tube. June. The upper leaves are often entire and quite narrow. *Large-flowered Syringa.*

2. P. CORONA'RIUS.

Leaves ovate, subdentate; *styles* distinct. Native country unknown. It is a handsome flowering shrub, often cultivated in our shrubberies. The flowers are numerous, white, showy, resembling those of the orange both in form and fragrance, but are more powerful in the latter respect. It grows 5—8 feet high, with opposite, smooth, ovate, stalked leaves, and opposite, reddish twigs bearing leafy clusters of flowers. *False Syringa.*

ORDER LXVII. HAMAMELACEÆ. *The Witch-Hazel Tribe.*

Cal.—Adherent to the ovary, 4-cleft.
Cor.—Petals 4, linear.
Sta.—8, those opposite the petals barren (or many and all fertile, with no petals).
Ova.—2-celled, ovules solitary.
Fr.—Capsule coriaceous, the summit free from the calyx, 2-beaked, 2-celled.

A small order of shrubs, native of N. America and Japan. The leaves are alternate, dentate, the veins running direct from the mid-rib to the margin. Stipules deciduous.—No remarkable properties have been discovered.

The only Northern genus is Hamamelis.

HAMAME'LIS.

Calyx 4-leaved or cleft, with an involucel of 2—3 bracts at base; petals 4, very long, linear; sterile stamens scale-like, opposite the petals, alternating with the 4 fertile ones; capsule nut-like, 2-celled, 2-beaked.

Gr. ἅμα, μηλον, that is, with an apple, because the fruit is upon the tree at the same time with the flowers.—Shrubs or small trees.

H. VIRGINIA'NA.

Leaves obovate, acuminate, undulate-dentate, cordate with a small sinus at base; *flowers* sessile, 3—4 together, with a yellowish calyx and 4 long, yellow, curled or twisted petals, appearing in October and the following months even through the winter. It is a large shrub, consisting of several rather crooked, branching trunks, from the same root, as large as the arm, and 10—12 feet high. Flowers in little close heads. Calyx with soft down. Capsule roundish, oblong, partly invested by the permanent calyx, containing 2 nuts. This curious shrub is not unfrequent in our forests, and amidst the reigning desolations of autumn and winter, this alone puts forth its yellow blossoms. The small branches were formerly used for "divining rods," to indicate the presence of the precious metals and of deep springs of water, and there are even at this day, persons who deem a denial of these virtues to the Witch-Hazel, an offence little short of heresy. *Witch-Hazel.*

ORDER LXVIII. UMBELLIFERÆ. *The Umbelliferous Tribe.*

Cal.—Adherent to the ovary, entire or 5-toothed.
Cor.—Petals 5, usually inflected at the point, imbricate in æstivation.
Sta.—5, alternate with the petals and inserted with them upon the disk.
Ova.—Inferior, 2-celled, surmounted by the fleshy disk which bears the stamens and petals.
Sty.—2, distinct, or united at their thickened bases. Stigma simple.
Fr.—Dry, consisting of 2 coherent carpels, separating from each other by their faces (*commissure*) into two halves (*merocarps*).
Carpophore,—the slender, simple or forked axis by which the carpels are borne, cohering to it by the faces of the commissure.
Ribs.—A definite number of ridges traversing the carpels, the larger ones (*primary*) alternating with the smaller (*secondary*).
Vittæ.—Little linear receptacles of colored volatile oil, imbedded in the substance of the pericarp, just beneath the intervals of the ribs and the commissure.

Herbaceous plants, with little that is attractive in their appearance. Stems hollow, furrowed. Leaves usually divided, simple or compound, with sheathing petioles. Flowers arranged in umbels, mostly white, often yellow, pink, blue or greenish.—This is a vast and well defined natural order, natives of damp places, way-sides, groves, &c. in the cool parts of the world. Very few are found in tropical countries except upon the mountains.

Properties aromatic, stimulant and carminative, depending upon a volatile oil residing in the vittæ of the fruit, in the roots, &c. The herbage is frequently pervaded by an acrid, narcotic principle, rendering it very poisonous. Of this nature is the Conium maculatum

(*hemlock*), Cicuta virosa, Œthusa Cynapium (*fool's parsley*), besides many others which have, at least, a suspicious character. But the fruit is never poisonous, and is usually stimulant and aromatic, as caraway, anise, dill, coriander, &c. Even the roots and herbage of other species are wholesome and nutritive, as the carrot, parsnip, sweet cisely, celery and Archangelica. The gum-resin, *assafœtida*, exudes from incisions in the Ferula of Persia; the *gum galbanum* is the product of Galbanum officinale, an Indian species.

The genera of the Umbelliferæ are numerous, and not easily distinguished. The characters by which De Candolle has more successfully than any other author divided this order into tribes and genera, are chiefly founded upon the number and development of the *ribs*, the presence or absence of the *vittæ*, and the form of the albumen, particularly at the commissure. These parts therefore, minute as they are, will require the special attention of the student.

Conspectus of the Genera.

I. ORTHOSPERMA. *Albumen (seeds) flat on the inner face.*

- Flowers white;
  - Umbels simple;
    - Fr. not prickly; Leaves peltate or cordate, — *Hydrocotyle.* 17
    - Fr. not prickly; Leaves linear, ... — *Crantzia.* 18
    - Fruit clothed with hooked prickles. . . — *Sanicula.* 1
  - Umbels compound;
    - Fruit evidently compressed
      - on the sides;
        - Involucre 0 or minute;
          - Involu. many-lvd., — *Cicuta.* 7
          - Involucels few-lvd. — *Cryptotænia.* 4
          - Involucels wanting. — *Carum.* 16
        - Involucre of entire bracts, — *Sium.* 3
        - Involucre of cleft bracts, — *Discopleura.* 20
      - on the back;
        - Margin of fruit singly-winged;
          - Stem slender, — *Archemora.* 12
          - Stem stout, — *Heracleum.* 14
        - Margin of fruit doubly-winged, — *Archangelica.* 11
    - Fruit scarcely comprsed,
      - not brstly, clothed with bristles, ...
        - Involucre 0 or 1—3-lvd;
          - Involucel 3-lvd. — *Æthusa.* 10
          - Involu. 5-7-lvd. — *Conioselinum.* 19
        - Involucre 4—6-leaved, . — *Ligusticum.* 9
      - Fruit contracted on the sides, . . — *Daucus.* 2
      - Fruit not contracted on the sides, — *Zizia.* 6
      - Fruit not contracted on the sides, — *Thaspium.* 8
      - Fruit compressed on the sides, . . — *Bupleurum.* 5
- Flowers yellow;
  - Involucels minute; . . . ; very large;
    - Ribs winged, — *Apium.* 21
    - Ribs rounded, on the sides. — *Anethum.* 15
    - Ribs rounded, on the back; seeds flat, — *Pastinaca.* 13
  - Involucels 0; fruit compressed;

II. CAMPYLOSPERMÆ. *Albumen (seeds) involute at the edges, forming a longitudinal furrow on the inner face.*

- Fruit linear-clavate, with bristly ribs. Flowers white; umbel few-rayed, — *Osmorhiza.* 22
- Fruit ovate, compressed at the sides, with smooth ribs. Flowers white. — *Conium.* 23

III. CÆLOSPERMÆ. *Albumen (seeds) involute at the base and apex.*

- Involucre of a single, bipinnatifid leaf; root tuberous, ... — *Erigenia.* 24
- Involucre of a single subulate leaf, or wanting; ribs obsolete, . . — *Coriandrum.* 25

SUBORDER 1, ORTHOSPERMÆ.

The inner surface of the seeds and albumen flat, or nearly so.

1. SANI'CULA.

Umbels nearly simple, capitate; flowers of the centre abortive; fruit solid, subglobose, armed with hooked prickles.

Lat. *sanare*, to cure; wonderful virtues were formerly imputed to the Sanicle as a vulnerary. Fls. polygamous, the outer without stamens, fertile; the inner barren. Cal. of the fertile fls. larger than of the barren, 5-leaved, acute. Pet. of barren fls. lanceolate, channelled, inflected; of the fer. deciduous or 0. Fil. hair-like, twice as long as pet. Ribs of the carpels 0. Vittæ numerous. —Perennial herbs. Flowers white or yellow.

S. MARYLA'NDICA.

Leaves 5-parted, digitate; *leaflets* or *segments* oblong, cut-serrate; staminate *flowers* numerous, stalked, perfect ones sessile; teeth of the *calyx* entire. Low woods and thickets. Stem erect, 1 foot high, smooth, furrowed, bearing a few

quinate leaves. Near the top it divides into two or more short branches, each of which divides again into peduncles, with small, capitate umbels of minute, white flowers. At the points of these divisions are situated leaflets apparently ternate, resembling involucres. Leaflets oblong-lanceolate, pointed at each end, cut into irregular, mucronate serratures, the lateral ones often confluent at base. Most of the flowers barren. Tube of the calyx echinate. Petals with a closely inflexed point, apearing emarginate. Jn. *Sanicle.*

2. DAUCUS.

Involucre pinnatifid; the central flower of each umbellet abortive; fruit oblong; carpels with 4 rows of flat prickles, and 3 intermediate, bristly ribs.

The Greek name of the Carrot. Cal. 5-toothed. Pet. emarginate with an inflected point, the 2 outer ones often largest and deeply 2-cleft. Each carpel with 5 primary ribs, of which 3 are on the back and 2 on the commissure, and 4 secondary ones, all bristly.—Biennial herbs.

D. CARO'TA.

Stem hispid; *petioles* nerved beneath; *leaves* tripinnate or pinnatifid, the segments linear, acute; *umbels* dense, concave. The word *kar* in Celtic signifies red, hence *carrot.* It is occasionally found wild in fields and by road sides. Root fusiform. Stem 2—3 feet high, branching. Leaves numerous, divided in a thrice pinnatifid manner, pale green. Umbels large and very compact, with white flowers, blooming all summer. Cultivation has produced several varieties. *Carrot.*

3. SIUM.

Involucres general and partial, the bracts many and entire; fruit nearly oval; carpels with 5 obtusish ribs and several vittæ in the intervals; petals obcordate with an inflexed point.

Celtic *siw*, water; that is, a genus of aquatic plants.—Perennial, leaves pinnately divided.

1. S. LATIFO'LIUM.

Leaves pinnate; *leaflets* oblong-lanceolate, acutely serrate; *stem* sulcate-angular. A tall plant, in swamps and ditches. Stem 3 feet high, hollow, smooth, with 7 deep furrows and prominent angles. Leaflets equally serrate, in about 4 pairs with an odd one, those submerged, if any, pinnatifid. Leaf-stalks embracing the stem at base. Umbels large, with numerous, small, white flowers. July. Aug. *Water Parsnep.*

2. S. LINEA'RE. *T. & G.* S. latifolium. *β.* lineare. *B.*

Leaves pinnate; *leaflets* linear, finely serrate; bracts of the *involucre* linear-lanceolate; *calyx teeth* minute; *fruit* obovate. In swamps. Stem three feet high, furrowed and angled as the above plant, which it so much resembles in its general aspect, as to have been generally, and perhaps correctly, considered only a variety.

4. CRYPTOTÆ'NIA.

Involucres 0; involucels few-leaved; margin of the calyx obsolete; fruit linear-oblong or elliptic-oblong; carpels with 5 obtuse ribs; vittæ very narrow, twice as many as the ribs.

Gr. κρυπτω, to conceal, ταινια, a wreath or border; in allusion to the obsolete border of the calyx.—Smooth, perennial herbs.

C. CANADE'NSIS. *Dc.* Sison Canadense. *L.*

Leaves ternate, smooth; *leaflets* rhomboid-ovate; *umbels* irregular. In moist woods. Stem smooth, 1—2 feet high. Leaves alternate, on long stalks embracing the stem at base. Leaflets in 3s, doubly serrate, the lower ones with one or more deep incision, the upper becoming nearly sessile. Umbels axillary and terminal, the partial ones with unequal rays, small, white flowers, and minute involucra; universal involucre wanting. Fruit elliptic-oblong, smooth. July. *Honewort.*

5. BUPLEU'RUM.

Involucres various; fruit laterally compressed; carpels 5-ribbed, the lateral ones marginal; seed teretely convex, flattish on the face; calyx margin obsolete; petals very short, broadish, entire, inflexed.

Gr. βους, an ox, and πλευρον, a rib; the application obscure.—Herbaceous or shrubby. Flowers all perfect, yellow.

B. ROTUNDIFO'LIUM.

Involucres 0; *involucels* of 5 ovate, mucronate bracts; *leaves* entire, broadly ovate, perfoliate. In fields and cultivated grounds, N. Y. Stem a foot or more high, branching. Leaves smooth, acute above, round and broad at base, one at the base of each branch. Involucels larger than the umbellets, of few (4—8) small, yellow flowers. Annual. *Thorough-wax.*

6. ZI'ZIA.

Umbels perfect; involucre 0; involucels few-leaved; petals acuminate, inflexed, carinate; fruit solid, gibbous; carpels with 5 ribs, the lateral ones marginal; seed plano-convex.

Gr. ζιζανιον, the name of some obscure plant.—Perennial herbs with yellow flowers.

1. Z. AU'REUM. *Dc.* Smyrnium aureum. *L.*

Leaves biternate; *leaflets* oval-lanceolate, serrate; *umbellets* with short rays. Hills and meadows. Stems 1—2 feet high, branching above, rather slender, erect, hollow, angular-furrowed, smooth as well as every other part of the plant, and furnished with few leaves. The lower leaves are on long petioles, the leaflets with coarse serratures and sometimes quinate. The umbels are about two inches broad, of 10—15 rays, the umbellets ½ inch broad, dense. Flowers numerous, orange-yellow. Fruit oval, brown, with prominent ribs. Root black, tufted, perennial. June. *Golden Alexanders.*

2. Z. INTEGE'RRIMA. *Dc.* Smyrnium integerrima. *L.*

Segments of the *leaves* oblique, oval, entire, very smooth, glaucous beneath; *lower leaves* tripinnate, upper ones bipinnate; *umbels* with elongated peduncles. Stem 12—18 inches high. Umbels terminal, loose, of long, slender

rays. Involucels of a few minute, subulate bracts. Leaves irregularly decompound, on a dilated foot-stalk, sheathing at the base. Calyx teeth obsolete. June. Per. *Entire-leaved Alexanders.*

7. CICU'TA.

Umbel perfect; involucre few-leaved or 0; involucels many-leaved; fruit subglobose; carpels with 5 flattish, equal ribs, 2 of them marginal; seeds terete.

A Latin name used by Virgil (Ec. 2d and 5th), but of unknown application. —Poisonous herbs, perennial, aquatic. Stems hollow. Flowers white, all perfect and uniform. Cal. of 5 broad, acute leaves. Pet. obcordate, the end inflected. Fil. long as corolla. Carpophore 2-parted.

1. C. MACULA'TA.

Stem spotted; *leaves* oblong, mucronately serrate. A common plant, 3—6 feet high, in wet meadows. Stem smooth, hollow, striate, jointed, glaucous, branched at top. Leaves compound, the lower ones thrice ternate, the upper ones ternate. Petioles dilated at base into long, abrupt, clasping stipules. Leaflets acuminate, finely serrate. Umbels without the universal involucra, partial umbels with short, acute, and narrow-leaved involucels. Fruit roundish, flattened, 10-furrowed, crowned with the permanent calyx and styles, and separating transversely into 2 seeds. Flowers white. A dangerous poison, but sometimes used in medicine. Jl. Aug. Per. *American Hemlock.*

2. C. BULBI'FERA.

Leaves decompound, with axillary bulbs; *leaflets* linear, with remote, divergent teeth. Known by its slight, attenuated foliage. Wet meadows. Stem 3—4 feet high, round, hollow, striate, green, with axillary branches. Leaves various, those of the stem generally biternate, those of the branches ternate. Leaflets long, narrow, linear and linear-lanceolate, with narrow, recurved teeth. Bulblets situated upon the branches, opposite, and within the axils of the bracteate leaf-stalks. Umbels terminal, with no universal involucra. Partial umbels of close, small, white flowers, and a slight involucel. August. Ann. *Bulbiferous Cicuta. Narrow-leaved Hemlock.*

8. THA'SPIUM.

Involucre 0; involucels 3-leaved, lateral; fruit elliptical; carpels convex, with 5 winged ribs.

Perennial herbs, with yellow or purple flowers.

T. CORDA'TUM. *Nutt.* Smyrnium cordatum. *Mx.* Zizia cordatum. *Dc.*

Radical leaves simple, cordate, crenate; cauline ones ternate, stalked; *segments* acute, serrate; *umbels* terminal Shady hills. Stem erect, slightly branched, smooth, 2—3 feet high. Root leaves on long stalks, roundish-heart-shaped, the rest ternate, becoming only 3-parted above, all light green. Umbels dense with yellow flowers. Fruit black, oval, with 3 prominent, rounded, depressed ridges on each side. May. Jn. Per. *Heart-leaved Alexanders.*

9. LIGU'STICUM.

Fruit oblong; carpels with 5 acute, equal furrows; petals equal, involute, entire; umbels perfect; involucre none.

From Liguria in Italy, said to be its native place. Fil. perfect. Cal. small, pointed, erect, broad at base. Pet. elliptical, flattish, undivided, contracted at each end. Seeds with 3 dorsal and 2 marginal, equal wings.

1. L. SCO'TICUM.

Stem leaves biternate, the *upper* ones ternate; *lateral leaflets* oblique, the *terminal* one rhomboid; *bracts* of the involucres numerous, linear. Sea coast. Root thick, tapering, perennial. Stem a foot high, nearly simple, striate, smooth. Leaves petiolate. Leaflets dark green, broad, smooth, serrate, entire at the base. Flowers white. July. *Sea Lovage.*

2. L. LEVI'STICUM.

Leaves numerous, long; *leaflets* incised above. A tall, strong-scented plant, native of Italy, cultivated for its reputed medicinal properties. Plant 5 feet high, with leaves of various and numerous divisions. Flowers white. June. July. Per. *Common Lovage.*

10. ÆTHU'SA.

Fruit globose-ovate; carpels with 5 ribs, the ribs acute and turgid, the lateral ones marginal, broader; intervals acute-angled; involucre none; involucels one-sided.

Gr. αἴθω, to burn; on account of its poisonous acridity. Flowers all perfect. Pet. obcordate, with an inflexed point. Calyx-teeth obsolete.—Annual, poisonous herbs.

Æ. CYNA'PIUM.

Leaves all uniform; *leaflets* pinnatifid. The specific name of this plant (κυνος, απιον) signifies dog's parsley. It grows in waste grounds, and much resembles Parsley in appearance, but the form of the leaf, with its narrow, cuneate segments, and its disagreeable odor, are sufficient to distinguish it. Stem 2 feet high, green, striate. Leaves all of one form, dark green, flat. Involucre wanting. Involucels consisting of 3 leaflets, deflected, long, linear, and situated on the outside. Jl. Aug. *Fool's Parsley.*

11. ARCHANGE'LICA.

Umbels perfect; fruit somewhat compressed, with 3, carinate, thick ribs upon each carpel, with 2 marginal ones dilated into membranaceous wings; vittæ very numerous.

So named by way of eminence, the plant being one of the largest, and possessing the most agreeable and useful properties of all the Umbelliferæ. Fls. all perfect. Cal. teeth short. Pet. equal, lanceolate, entire, acuminate, with the point inflected, shorter than the stamens. Commissure with 2—4 vittæ. Carpophore 2-parted.—Perennial herbs.

1. A. ATROPURPU'REA. *Hoffm.* Angelica triquinata. *Mx.*

Stem dark purple, furrowed; *petioles* 3-parted, the divisions quinate; *leaflets* incisely toothed, odd leaflet of the terminal divisions rhomboidal, sessile, the others decursive. A large umbelliferous plant, well known for its aromatic qualities, in fields and meadows. Stem 5 feet high, an inch or more in thickness, hollow, smooth, glaucous. Leaves oftener biternate than quinate, smooth, pale and veiny beneath, on large, inflated petioles, which are channeled on the upper side and dilated at base into large, inflated stipules.

Leaflets cut-serrate, the terminal one sometimes 3-lobed, the lateral ones of the upper division decurrent. Umbels 3, terminal, spherical, 6—8 inches in diameter, without the involucre; umbellets on angular stalks and with involucels, of subulate bracts longer than the rays. Flowers greenish white. June. *Common Angelica.*

2. A. HIRSU'TA. *T. & G.* Angelica hirsuta. *Mh.*

Stem striate, the summit with the umbels tomentose-hirsute; *leaves* bipinnately divided, the divisions quinate, segments oblong, acutish, the upper pair connate but not decurrent at base. Dry woods, N. Y. Stem simple, straight, erect, 4 feet high. Umbels on long, velvety peduncles. Involucels about as long as the rays. July. Aug.

3. A. OFFICINA'LIS. *Hoffm.* Angelica Archangelica. *L.*

Stem smooth, round, striate; *leaves* bipinnately divided into lobate, subcordate, acutely serrate segments, the terminal one 3-lobed; *sheaths* large and saccate. Said to be native in Labrador, &c. Cultivated in gardens occasionally for the sake of the stalks, which are to be blanched and eaten as celery. *Garden Angelica.*

12. ARCHE'MORA.

Involucres 0 or few-leaved; involucels many leaved; fruit oval, compressed; capsules with 5 ribs, the lateral ones marginal and winged; carpophore 2-parted; seeds flat.—Perennial herbs.

A. RI'GIDA. *Dc.* Œnanthe rigida. *N.*

Glabrous; *stem* terete; *leaves* pinnately divided, leaflets oblong-lanceolate or ovate, rather rigid, entire, or remotely denticulate or dentate. Swamps, N. Y. Stem 2—4 feet high. Leaflets from 3 to 11, with few or many teeth, or none, varying also in outline in the same plant. Flowers white, in thin umbels. Sept.

β. (E. *longifolia* P.) *Leaflets* long, linear, mostly entire; *involucres* nearly wanting. Stem 3—5 feet high. *Water Drop-wort.*

13. PASTINA'CA.

Fruit much compressed, oval, with a broad margin; carpel with 5 nearly obsolete ribs, the intervals with single vittæ; carpophore 2-parted; seeds flat.

A Latin name formerly applied to the carrot, from *pastus*, food. Fls. perfect. Cal. of 5 minute teeth. Pet. broad-lanceolate, entire, involute, as long as stamen.—Herbs, perennial or biennial.

P. SATI'VA.

Leaves pinnate, downy beneath; *leaflets* oblong, incisely toothed, the upper one 3-lobed. The parsnep is said to have been introduced, but it grows wild abundantly in fields, by fences, &c. The root is fusiform, large, sweet-flavored, esculent, as every one knows, in its cultivated state, but in its wild state becomes hard, acrid and poisonous, and much dwindled in size. Stem 3 feet high, erect, furrowed, smooth, branching. Umbels large, terminal. Flowers yellow, small. Fruit large, flat. The abundance of saccharine mat-

ter in the cultivated root, renders it a wholesome and nutritious food. July Bienn. *Parsnep.*

14. HERA'CLEUM.

Fruit compressed, flat, with a membranaceous margin and 3, dorsal, obtuse ribs to each carpel; flowers radiant; involucre deciduous; petals notched.

Named after the hero Hercules, it being a rank, robust plant. Cal. of five small, acute teeth. Pet. obcordate, radiant in the exterior flowers.—Large, perennial herbs.

H. LANA'TUM.

Leaves ternate, petiolate, tomentose beneath; *leaflets* petioled, round-cordate, lobed; *fruit* orbicular. A large, coarse-looking, umbelliferous plant, growing about moist, cultivated grounds. Stem about 4 feet high, thick, furrowed, branching, and covered with spreading hairs. Leaves very large, on channeled stalks. Leaflets woolly underneath, irregularly cut-lobed and serrated. At the top of the stem and branches are its huge umbels, often a foot broad, with spreading rays, and long-pointed, lanceolate involucels. Involucre of lanceolate, deciduous leaflets. Petals deeply heart-shaped, white. June. Perennial. *Cow-parsnep.*

15. ANE'THUM.

Involucre 0; petals involute, yellow; carpels compressed, with 3 ribs; intervals one-ribbed.

Gr. ανω, upwards, θεινω, to spring; from the rapidity of its growth.

1. A. GRAVE'OLENS.

Fruit compressed. The native country of the dill is Spain. Distinguished from the next species by its annual root, its glaucous leaves, and its broader and flatter seeds. These have a warm, burning taste, and are used in medicine as a carminative. Stem 3 feet high, with umbels of yellow flowers. *Dill.*

2. A. FANI'CULUM.

Fruit ovate. Native of S. Europe. Root strong, fleshy, perennial. Stem about 4 feet high, with numerous leaves much divided, less glaucous than the Dill. Umbels of about a dozen spreading rays. Flowers yellow. Its medicinal properties are similar to those of the Dill, though less active. *Fennel.*

16. CARUM.

Fruit elliptic, oblong, with equidistant ribs; intervals convex; calyx minute or obsolete; petals obcordate, unequal; styles dilated at base, spreading; receptacle permanent; central flowers barren.

From *Caria*, where it is native according to Pliny.

C. CA'RUI.

Stem branched; *sheaths* ventricose; *common involucre* 0. Native of Europe, &c. This plant is cultivated chiefly for the seeds which are often added

to cakes, sugar-plums, &c. for their fine aromatic flavor. The root also, has been used as a pot-herb, and is said to be superior in flavor to the parsnep. *Caraway.*

17. HYDROCO'TYLE.

Fruit orbicular, compressed, 3-ribbed, commissure narrow; umbel simple; involucre 4-leaved.

Gr. ὕδωρ, water, and κοτυλη, vessel; its round, concave leaf holds a drop of water in the centre. Fl. perfect. Cal. obsolete. Pet. equal, ovate, spreading, entire. Style shorter than sta.—Herbaceous plants, usually aquatic.

1. H. AMERICA'NA.

Root tuberous; *leaves* reniform, roundish lobed, crenate; *umbels* sessile, few-flowered. A very small, delicate plant, found close to the moist earth under the shade of other vegetables. Stem prostrate, creeping, a few inches long, filiform. Leaves very smooth and thin, light-colored, roundish, slightly 7-lobed, crenate and cut at base to the insertion of the stalk. Flowers minute, glomerate, in very small, sessile umbels or heads. Jl. Per. *Pennywort.*

2. H. UMBELLA'TA.

Leaves peltate, crenate, emarginate at base; *umbels* stalked, many-flowered; *flowers* stalked. An aquatic species, larger than the foregoing, in ponds and wet grounds. Stem creeping, often submerged. Leaves peltate, the base notched so as to appear somewhat reniform, floating or erect. Flowers 20 or more in a single umbel, greenish. Jl. Per. *Umbelled Pennywort.*

3. H. INTERRU'PTA. *Muh.* H. Vulgaris. *Mx.*

Leaves peltate, orbicular, crenate; *umbels* capitate, about five-flowered. Grows in marshes, more rare in N. Eng. than the preceding. Root and stem creeping. Leaves referred to by Linnæus as a perfect example of the *peltate* form, the stem being inserted near the middle. From the centre of the umbel another is often produced. Jn. Per. *Common Pennywort.*

18. CRA'NTZIA.

Calyx-tube sub-globose, the margin obsolete; petals obtuse; fruit subglobose, the commissure excavated, with 2 vittæ; carpels unequal, 5 ribbed, with a vittæ in each interval.

Small, creeping herbs, with linear or filiform, entire leaves. Umbels simple, with a few white or reddish flowers.

C. LINEA'TA. *Nutt.* Hydrocotyle lineata. *Mx.*

Leaves cuneate-linear, sessile, with transverse nerves, and obtuse at the end. Grows on river banks, &c. the stems a few inches in length, creeping in the mud. June. July.

19. CONI'OSELI'NUM.

Calyx-teeth obsolete; petals obovate, with an inflected point; fruit compressed on the back; carpels with 5 winged ribs, the lateral ones marginal and much the broadest.

Name compounded of *Conium* and *Selinum.* Smooth, biennial herbs. Leaves on very large, inflated petioles. Stems hollow.

C. CANADE'NSE. *T. & G.* Cnidum Canadense. *Spr.*

Fruit broadly oval; *vittæ* solitary in the dorsal intervals, 5—3 in the lateral ones. In damp woods, growing 3—5 feet high. Leaves compounded in a pinnate manner, dissected into pinnatifid segments. Umbels compound. Involucre wanting, or of a few, subulate bracts. Involucels of 5—6 bracteoles. Flowers white. Rare. Aug. Sept.

20. DISCOPLEU'RA.

Calyx-teeth subulate, persistent; petals ovate, entire, with a minute inflexed point; fruit ovate, often didymous; carpels 5-ribbed, the 3 dorsal, filiform, sub-acute, prominent; the 2 lateral, united to a thick, accessory margin; seeds subterete.

Gr. δισκος, the disk, and πλευρα, a rib; i. e. the disk and ribs (of the seed) united. Intervals with single vittæ. Bracts of the involucre 3—5-parted or nearly entire.—Annual herbs.

D. CAPILLA'CEA.

Erect or procumbent; *umbels* 3—10-rayed; *leaflets* of the *involucre* 3—5, generally 3-cleft. In swamps (Conn.), growing about a foot high, with many branches, and leaves numerous, cut and cleft in a ternate manner into capillary segments. Involucels large. Flowers white, succeeded by ovate fruit.

21. A'PIUM.

Fruit roundish, ovate, with 6 acute, dorsal ribs, intervals flat; petals roundish, subequal, with an inflected point; styles greatly dilated at base.; receptacle thin, round, wavy; flowers all perfect.

Celtic *apon*, water; the plant grows in watery situations. European.

1. A. PETROSELI'NUM.

Cauline leaves linear; *involucra* minute. This well known seasoning-herb, is said to be a native of Sardinia. Cultivation has produced several varieties. The roots of the larger varieties are used to communicate an agreeable flavor to soups. The leaves are much esteemed for soups and as a garnish. Stem about 3 feet high, with umbels of yellowish flowers. Jn. Bienn. *Parsley.*

2. A. GRAVE'OLENS.

Cauline leaves wedge-shaped. Native of Britain. Highly esteemed as a salad, and as a seasoning in soups. It is a remarkable instance of the effect of cultivation, being in its wild state, rank, coarse and unfit to eat; and when properly cultivated, sweet, crisp, juicy and of a most agreeable flavor. Hight 4 feet. Flowers white. Jn.—Aug. Bienn. *Celery*

SUBORDER II, CAMPYLOSPERMÆ.

The inner surface of the seed deeply furrowed, or with involute margins.

22. OSMORHI'ZA.

Involucre few-leaved; involucel 4—7-leaved; flowers of

the centre abortive; fruit stipitate, clavate, polished, partly hispid; carpels acutely costate.

Gr. οσμη, perfume, ριζα, root; from the aromatic root of this plant, which in fragrance as well as flavor, resembles Anise. Cal. segment obsolete. Pet. oblong, nearly entire, the point inflexed. Fr. solid, linear, very long, tapering to the pedicel, bristly at base.—Perennial herbs.

1. O. LONGI'STYLIS. *Dc.* Uraspermum Claytonia. *Nutt.*

Styles filiform, nearly as long as the ovary; *fruit* clavate. A leafy plant, very common in woods, 1—3 feet high, with inconspicuous umbels of white flowers. Root branching, fleshy, of an agreeable, spicy flavor. Stem erect, branching above, nearly smooth. Root leaves on long, slender stalks, the upper stem leaves sessile, both are decompound, the ultimate divisions often pinnate; leaflets irregularly divided by clefts and sinuses into lobes and teeth, the lobes broadly ovate, slightly pubescent. Involucres of linear bracts longer than the rays. Fruit blackish, an inch in length, much more acute at the base than at the summit, crowned with the persistent styles. May. Jn.
Sweet Cisely.

2. O. BREVI'STYLIS. *Dc.* U. hirsutum. *B.*

Styles conical, scarcely as long as the breadth of the ovary; *fruit* somewhat tapering at the summit. Common in woods. The general aspect of this species is very similar to that of the preceding, but the root is destitute of the anise-like flavor of that species, being disagreeable to the taste. The plant is more hairy, and with more deeply cleft divisions in the leaves. Involucre deciduous. Umbels with long, diverging rays, of which but few prove fertile. The fruit is similar to the last, but crowned with convergent, not with spreading styles. May, Jn.

23. CONI'UM.

Umbel perfect, with general and partial involucra, the partial half wanting; fruit ovate, solid; carpels with 5-acute, undulate-crenulate ribs, the lateral ones marginal.

Gr. κωνειον, Hemlock, from κωνος, a top; because it made those dizzy who drank it. Fls. perfect. Cal. obsolete. Pet. obcordate, with an acute, inflected point. Fil. scarcely as long as the cor. Ova. ovate, a little flattened, rugose, furrowed; fr. crowned with the wavy, floral receptacle and the spreading styles.—Biennial, poisonous herbs.

C. MACULA'TUM.

Stem spotted; *leaves* tripinnate; *leaflets* lanceolate, pinnatifid; *fruit* smooth. Grows in waste grounds, way sides, &c. A well known poisonous plant. Stem much branched, about 4 feet high, very smooth, round, hollow, with purplish spots. The lower leaves are very large, several times pinnate, bright green, on long, sheathing foot-stalks. Umbels terminal, the involucre of 6—8 lanceolate bracts, the involucels with the inner half wanting. Flowers small, white. Fruit with undulate or wrinkled ribs. The plant is a powerful narcotic, exhaling a disagreeable odor when bruised. Used in medicine. Jl. Aug.
Poison Hemlock.

SUBORDER III, CŒLOSPERMÆ.

Seeds incurved at the base and apex.

24. ERIGENI'A.

Involucre a single, bipinnatifid bract; involucel of 3—6 entire bracts; fruit contracted at the commissure; carpels 3-ribbed, ovate-reniform. Root tuberous. Leaf solitary, radical.

Gr. ηριγενεια, daughter of the early spring; in reference to the early flowering of these plants, which occurs in March and April.

E. BULBO'SA. *Nutt.* Hydrocotyle composita. *P.*

A small, early-flowering perennial herb, along the shady banks of streams, western N. Y. to the Mississippi. Stem an inch or two high, with 2 leaves. The lower one radical, biternately divided, the divisions incisely cleft into narrow segments; the upper one a bract, similarly divided, supporting the few-rayed umbel of white flowers.

25. CORIA'NDRUM.

Fruit a single or double globe, smooth, without ribs; calyx broad, unequal; petals radiant; floral receptacle none.

Gr. κοριις, a bug; on account of the smell of the leaves.

C. SATI'VUM.

Fruit globose; *calyx* and *styles* permanent. Native in Europe, &c. This well known plant is cultivated chiefly for the seeds, which are used as a spice, as a nucleus for sugar-plums, &c. Stem 2 feet high. Leaves numerously divided, strong-scented. Umbels with only the partial involucra. Flowers white. July. Annual. *Coriander.*

ORDER LXIX. ARALIACEÆ.

Cal.—Superior, entire or toothed.
Cor.—Petals 5—10, deciduous, rarely 0, valvate in æstivation.
Sta.—Equal in number to the petals and alternate with them. *Anth.* introrse.
Ova.—Crowned with a disk, 2 or many-celled. Ovules solitary. Styles as many as cells.
Fr.—Baccate or drupaceous, of several one-seeded cells.

A small order nearly allied to Umbelliferæ, from which it is distinguished chiefly by the several-celled ovary and fleshy fruit. They are natives of Northern temperate climes of both Hemispheres.—Several species are well known in medicine, &c. as ginseng, spikenard, sarsaparilla, &c. The latter is sometimes substituted for the sarsaparilla of the shops.

Conspectus of the Genera.

Leaves compound.	Flowers perfect.	*Aralia.* 1
	Flowers polygamous.	*Panax.* 2

1. ARA'LIA.

Flowers umbelled, involucre very small; calyx very small, superior, 5-toothed; corolla 5-petaled; berry crowned with the remains of the calyx, 5-seeded.

Name of unknown origin. Umbels simple, globose. Pet ovate, oblong, spreading or reflexed. Stig. nearly round, varying in number from 5 to 10. Seeds hard, oblong.

1. A. NUDICAU'LIS.

Nearly stemless; *leaf* solitary, decompound; *scape* naked, shorter than the leaf; *umbels* few. A well known plant, found in woods, most abundant in rich and rocky soils. Its structure is singular. It has a large, fleshy root, from which arise a leaf-stalk and a scape, but no proper stem. The former is long, supporting a single, large, compound leaf, which is either 3-ternate or 3-quinate. Leaflets oval and obovate, acuminate, finely serrate. The scape is about a foot high, bearing 3 umbels of greenish flowers. The root is aromatic, and in great demand since the invention of the *patent* syrup which bears its name. June. July. *Wild Sarsaparilla.*

2. A. RACEMO'SA.

Stem herbaceous, smooth; *leaves* decompound; *peduncles* axillary, branching, umbelled. In rocky woods. Stem 3—4 feet high, dark green or reddish, arising from a thick, aromatic root. The leaf-stalks divide into 3 partitions, each of which bears 3 or 5 large, ovate, serrate leaflets. Umbels numerous, arranged in branching racemes from the axils of the leaves or branches. The root is pleasant to the taste, and highly esteemed as an ingredient in small beer, &c. July. Per. *Pettymorrel. Spikenard.*

3. A. HISPI'DA.

Stem shrubby at base, hispid; *leaves* bipinnate; *leaflets* ovate, cut-serrate; *umbels* on long peduncles. Common in slovenly fields, about stumps and stone-heaps. Stem 1—2 feet high, the lower part woody and thickly beset with sharp, stiff bristles, the upper part branching, herbaceous. Leaflets many, ending in a long point, ovate, smooth. Umbels many, simple, globose, axillary and terminal, followed by bunches of dark-colored, nauseous berries. The plant exhales an unpleasant odor. Jl. Aug. *Wild Elder. Bristly Aralia.*

2. PANAX.

Flowers polygamous. *Perfect fl.*—Calyx 5-toothed, superior; corolla 5-petaled; stamens 5; styles 2—3; berry subcordate, 2—3-seeded. *Staminate fl.*—Calyx entire; petals 5; stamens 5.

Gr. παν, all, ακος, a remedy; that is a *panacea*, a universal remedy. In the estimation of the Chinese, this high-sounding title is merited by the ginseng, P. quinquefolium. The genus also includes the common ground-nut. Perennial herbs.

1. P. TRIFO'LIUM.

Root tuberous; *leaves* 3, ternate or quinate; *leaflets* wedge-lanceolate, sub-sessile, serrate; *styles* 3; *berry* tricoccous. This little plant is common in low woods in N. Hampshire and Vermont, where it is generally known by the name ground-nut. The root is a round tuber nearly half an inch in diameter, deep in the ground, connected with the stem by a short, screw-like ligament. The stem arises 3—6 inches above the surface, smooth, slender, simple. At the summit is a whorl of 3-compound leaves, with a central peduncle terminating in a little umbel of pure white flowers. Leaflets generally 3, nearly or quite smooth. Barren and fertile flowers on different plants, the latter without stamens, succeeded by green berries, the former with a single, abortive style. May. *Dwarf Ginseng. Ground-Nut.*

2. P. QUINQUEFO'LIA.

Root fusiform; *leaves* 3, quinate; *leaflets* oval, acuminate, petiolate, serrate. The ginseng is generally found in rocky or mountainous woods. The root is

light-colored, thick and fleshy. The stem is round, smooth, often reddish, simple, 1--2 feet high, with a terminal whorl of 3 compound leaves, and a central peduncle bearing a simple umbel. Leaves on round and smooth footstalks, consisting of 5, rarely 3 or 7 obovate leaflets. The flowers are small, yellowish, on short pedicels. The barren ones borne on separate plants have larger petals and an entire calyx. The fertile ones are succeeded by berries of a bright scarlet color. The root is in little estimation as a drug with us, but it enters into the composition of almost every medicine used by the Chinese and Tartars. June. July. *Ginseng.*

ORDER LXX. CORNACEÆ. *The Cornus Tribe.*

Cal.—Sepals adherent to the ovary, the limb minute, 4 or 5-toothed or lobed.
Cor.—Petals 4 or 5, distinct, alternate with the teeth of the calyx.
Sta.—Of the same number as petals and alternate with them.
Ova.—1 or 2-celled. *Fruit* a baccate drupe, crowned with the calyx.

A small family of trees and shrubs, seldom herbs. Leaves opposite, (alternate in one species) without stipules, with pinnate veins. Hairs fixed by the centre. They are natives throughout the Temperate Zone of both continents. The order is distinguished for its bitter and astringent bark. That of Cornus florida is an excellent tonic, similar in its action to the Peruvian bark.

Cornus is the only North American genus.

CORNUS.

Calyx 4-toothed; corolla 4-petaled; drupe baccate, with a 2-celled nucleus; involucre 4-leaved or 0.

Lat. *cornu*, a horn. The wood has been considered as hard and durable as horn. The Romans constructed warlike instruments of it; *bona bello cornus*, says Virgil. Trees, shrubs and perennial herbs, with mostly opposite leaves which are entire and pinnately veined. Flowers in cymes. Hairs centrally fixed. Floral envelopes valvate in æstivation.

*Flowers cymose; involucre 0. SHRUBS.

1. C. STOLONI'FERA. *Mx.* C. alba. *Wang.*

Stems often stoloniferous; *branches* smooth, spreading; *shoots* virgate; *leaves* broad-ovate, acute, pubescent, hoary beneath; *cymes* naked, flat; *berries* white. A small tree, 8—10 feet in hight, with smooth, slender, spreading branches, which are commonly red, especially in winter. It often sends out from its base prostrate and rooting stems, with erect shoots. Leaves distinctly nerved, minutely pubescent and whitish tomentose beneath, petiolate and pointed. Flowers in terminal cymes, white, followed by bluish white drupes. According to Dr. Bigelow, it sometimes blossoms twice a year. May. Jn. *White-berried Cornel or Dogwood.*

2. C. ALTERNIFO'LIA.

Leaves alternate, oval, acute, hoary beneath; *branches* alternate, verrucose; *drupes* purple, globose. A small tree, about twice the hight of the last, in moist woods. The branches are smooth, even, spreading from the upper part of the stem, and forming a depressed summit. Bark greenish, marked with warty streaks. Leaves irregularly scattered along the branches, oval-lanceolate, acute, entire, nerved, whitish underneath, on rather long stalks. Flowers pale buff-color, in a loose cyme. Jn. *Alternate-leaved Cornel or Dogwood.*

3. C. CIRCINA'TA.

Branches verrucose; *leaves* orbicular or very broadly oval, white tomentose beneath; *cymes* spreading, depressed; *drupes* light blue. A shrub some six feet high. Stem greyish, upright, with opposite, cylindrical, green, spotted or warty branches. Leaves large, about as broad as long, opposite, acuminate, covered with a white, thick down on the under side. Flowers white. Berries hollowed at base, soft, crowned with the remains of the style. Jn.

Round-leaved Cornel or Dogwood.

4. C. SERIA'CEA.

Branches spreading; *branchlets* woolly; *leaves* ovate, rounded at base, acuminate, ferruginous, pubescent beneath; *cymes* depressed, woolly; *drupes* bright blue. A variety has leaves tapering at base. A shrub about 8 feet high, with opposite, dusky purple branches, and dark red shoots. Leaves entire, varying from ovate and oval to lanceolate, pointed, nearly smooth above, with rather prominent veins. Flowers yellowish white, appearing in June.

Red Osier.

5. C. PANICULA'TA.

Branches erect, smooth; *leaves* ovate-lanceolate, acuminate, acute at base, scabrous above, hoary beneath; *cymes* paniculate; *drupes* white. A handsome shrub, 10 feet high, common in low woodlands and thickets. It has numerous and very branching stems, covered with a greyish bark, the shoots chestnut-colored. In June it puts forth its small white flowers in numerous, conical cymes or panicles, succeeded by small drupes.

Panicled Cornel or Dogwood.

** Flowers umbellate; involucre 4-leaved, petaloid.

6. C. FLO'RIDA.

Aboreous; *leaves* opposite, ovate, acuminate, entire; *flowers* small, in a close, cymose umbel or head, surrounded by a very large, 4-leaved, obcordate involucre. A tree from 20 to 30 feet in hight, very ornamental when in flower. Found in woods, Fall Mt. Walpole, N. H., and thinly dispersed from thence to Florida. The wood is very hard and compact, covered with a rough bark which is extremely bitter, and used in medicine as a tonic. The leaves, which at flowering time are but partially expanded, are acutely ovate, nearly smooth, veiny, pale underneath. The tree flowers are inconspicuous, greenish-yellow, but the involucre is very large and showy, of veiny, white, obovate leaves, ending in a callous point, which is turned up or down so abruptly as to give an emarginate appearance to the leaf. Flowers in May, in great profusion. Drupe red. *Flowering Dogwood.*

7. C. CANADE'NSIS.

Herbaceous, low; *upper leaves* whorled, veiny, on short petioles; *stem* simple. A small, handsome plant, common in woods, remarkable for its large, white involucre. Subterranean stems creeping, woody, root-like. The flowering stems erect, 4—8 inches high, bearing 2 small stipules in the middle, and a whorl of 6 leaves at the top. two of which are larger, placed a little lower and opposite. An umbellate cyme of flowers arises from the centre of the whorl, and with its large, showy involucre of 4 white leaves, might easily be taken for a single flower. They are succeeded by a bunch of red berries. The barren stems support a whorl of 4 equal leaves. May. Jn.

Low Cornel or Dogwood.

SUBCLASS II. MONOPETALÆ.

Floral envelops consisting of both calyx and corolla, the latter composed of petals more or less united (monopetalous).

ORDER LXXII. CAPRIFOLIACEÆ. *The Honeysuckle Tribe.*

Cal.—Adherent to the ovary (superior), the limb 5- (rarely 4-) cleft or toothed.
Cor.—Tubular or rotate, regular or irregular. [and inserted on the tube.
Sta.—As many, or one less than as many as the lobes of the corolla, alternate with them
Ova.—3- (rarely 4 or 5-) celled. *Style* 1. *Stig.* 1—4.
Fr.—Baccate, fleshy or dry, crowned with the persistent calyx lobes. *Seeds* pendulous.

An order of shrubs (rarely herbaceous), often twining, with opposite leaves and no stipules. They are chiefly natives of the Northern temperate regions, and occasionally found in the Alpine parts of the tropical zone.

Properties. The fever-root (Triosteum perfoliatum) is a mild cathartic, and in large doses emetic; the dried and roasted berries are sometimes substituted for coffee. The leaves and bark of the elder are both emetic and cathartic; the flowers are sudorific, and the berries laxative. The beauty and fragrance of the honeysuckles in cultivation are well known to every one.

The Order consists of two distinct Tribes; Lonicereæ and Sambuceæ.

Conspectus of the Genera.

Corolla tubular.	Shrubs.	Berry 1—3-celled,	few-seeded.	*Lonicera.*	1
			many-seeded.	*Diervilla.*	2
		Berry 4-celled, 2-seeded.		*Symphoricarpus.*	4
	Herbs.	Stamens 4.	Trailing, evergreen.	*Linnæa.*	5
		Stamens 5.	Stem erect, simple.	*Triosteum.*	3
Corolla rotate, regular.		Shrubs with	simple leaves.	*Viburnum.*	7
			pinnate leaves.	*Sambucus.*	6

TRIBE 1, LONICEREÆ.

Corolla tubular, the limb often irregular. Style filiform.

1. LONI'CERA.

Calyx 5-toothed, the tube subglobose; corolla infundibuliform or campanulate, limb 5-cleft, often labiate; stamens 5; ovary 2—3-celled; berry few-seeded; stigma capitate.

Named after Adam Lonicer, a physician of Frankfort, in the 16th century. A genus of climbing or erect shrubs, with opposite, entire and often connate leaves.

* Stem climbing. Flowers sessile, verticillate. CAPRIFOLIUM.

1. L. HIRSU'TA. *Eaton.* Caprifolium pubescens. *Goldie.*

Hairy; *corolla* ringent; *filaments* bearded; *leaves* hairy above, soft villose beneath, veiny, broad-oval, abruptly acuminate, the upper pair cornate-perfoliate. A shrubby climber found in woods, twining about trees to the hight of 15 or 20 feet. The whole plant is more or less hairy. Leaves pale green, not shining, the edges and the upper side ciliate with scattered hairs. The flowers are large, numerous, greenish-yellow, in whorled, axillary and terminal clusters. Limb of corolla spreading. Style and stamens exsert. Jn.
Hairy Honeysuckle.

2. L. PARVIFLO'RA. *Lam.* Caprifolium parviflorum. *P.*

Smooth; *corolla* ringent; *flowers* in heads of several approximate whorls; *leaves* shining above, glaucous beneath, oblong, all cornate, the upper pair

perfoliate. A small, smooth, shrubby climber, in rocky woods. Stem 8—10 feet long. Leaves wavy and revolute on the margin, very glaucous on the under side. Flowers rather small. Corolla yellow, tinged with dull red, gibbous at the base, the short limb in curled segments. Stamens and style exserted. Berries orange colored. May. Jn. *Small-flowered Honeysuckle.*

3. L. FLAVA. *Sims.* Caprifolium Fraseri. *P.*

Smooth; *flowers* in small heads of close whorls; *corolla* smooth, with a slender *tube* not gibbous at base, the *limb* somewhat ringent; *filaments* smooth. This is a beautiful shrub, scarcely twining, found on river banks and Catskill Mts. It is also cultivated in shrubberies. Leaves ovate, very smooth above, somewhat glaucous beneath, the upper pair cornate-perfoliate, the rest distinct. Flowers in heads of about 10, fragrant. Corolla an inch or more in length, the tube much longer than the limb, bright yellow. Upper lip much broader than the lower, in 4 segments. Jn. Jl. *Yellow Honeysuckle.*

4. L. GRATA. *Ait.* Caprifolium gratum. *P.*

Flowers in spikes of axillary whorls; *corolla* ringent, the tube long, slender, not gibbous; *leaves* evergreen, obovate, smooth, glaucous beneath, the upper pairs connate-perfoliate. A beautiful climbing species, in damp woods, ascending 15—20 feet. Flowers large and very fragrant, 5 or 6 in each whorl. Corolla pale yellow within, becoming reddish without. Stamens exserted. Berries red. The leaves are very obtuse, ending in a short, abrupt point. June. *Evergreen Honeysuckle.*

5. L. SEMPERVI'RENS. *Ait.* Caprifolium sempervirens. *Mx.*

Flowers in nearly naked spikes of distant whorls; *corolla* trumpet-shaped, nearly regular; *leaves* oblong, evergreen, the upper ones perfoliate-connate. In its wild state this species is found in moist groves and borders of swamps, N. Y., but in cultivation is a frequent inhabitant of our gardens and shrubberies. Few plants are more admirable for the beauty of their flowers, though they are deficient in fragrance. Stem woolly, twining with the sun. Leaves ovate or elliptical, of a dark, perennial green above. Corolla trumpet-shaped, nearly 2 inches long, dilated at the mouth, with 5 short, nearly regular segments, of a fine scarlet without and yellow within. May—Aug. *Trumpet Honeysuckle.*

6. L. PERICLY'MENUM. *Tourn.* Caprifolium Periclimenum. *L.*

Flowers in ovate, imbricate, terminal heads; *corolla* ringent; *leaves* all distinct, deciduous. A woody climber, native of Europe, but cultivated and naturalized. Leaves short stalked, elliptic. Flowers yellow and red, fragrant. Berries red. May—July. *Woodbine Honeysuckle.*

β. quercifolia; oak-leaved; leaves sinnate.

7. L. ITA'LICUM. *Dc.* Caprifolium Italicum. *L.*

Flowers in a terminal whorl; *corolla* ringent; *leaves* deciduous, the upper pairs perfoliate-connate. Native of Europe. Greatly admired in cultivation for its beauty and fragrance. Flowers with various hues of red, yellow and white. June—Aug. *Common Italian Honeysuckle.*

** Stem erect. Flowers pedunculate, geminate. XYLOSTEUM.

8. L. CILI'ATA. *Mh.* Xylosteum ciliatum. *P.*

Berries distinct; *leaves* ovate, sub-cordate, ciliate; *corolla* saccate at base, with short and subequal lobes; *style* exserted. A branching, erect shrub,

found in woods, 3—4 feet high. Leaves thin, oblong-ovate, often cordate at the base, somewhat ciliate on the margin, and villose beneate when young. Flowers pale straw-yellow, in pairs at the top of the peduncle, with an obtuse spur turned outwards at the base. Berries ovoid, red, in pairs, but not connate, 3—5-seeded. June. *Fly Honeysuckle.*

9. L. OBLONGIFO'LIA. *Hook.* Xylosteum oblongifolium. *Goldie.*

Berries connate, or united into one, globose, purple; *leaves* oblong or oval, velvety-pubescent beneath; *corolla* deeply bilabiate, gibbous at base; *peduncles* erect, long, filiform. A shrub 3—4 feet high, growing in swamps. Leaves on short stalks. Peduncles about as long as the leaves. Corolla hairy, greenish yellow outside, purplish inside, the lower lip nearly entire, the upper one 4-lobed, erect. Berries marked with the remains of the two calyxes. Jn.

10. L. CŒRU'LEA. *L.* Xylosteum villosum. *B.* X. Solonis. *Ea.*

Berries connate or united into one, deep blue; *leaves* oval, obtuse, villose on both sides, becoming nearly smooth; *peduncles* short, reflexed in fruit; *bracts* longer than the ovaries. A small shrub, in rocky hills and woods. Stem 2 feet high, with small leaves and pairs of small, yellow flowers, which are longer than their peduncles. Leaves ovate, oval, obovate and oblong, ending abruptly. May. June.

2. DIERVI'LLA.

Calyx tube oblong, limb 5-cleft; corolla twice as long, funnel-shaped; the limb 5-cleft, and nearly regular; stamens 5; capsular fruit 2-celled, many-seeded.

Dierville, a French surgeon, sent this shrub from Acadia, where he was traveling, to Tournefort, who named it after him. Shrubs, with ovate or oblong, serrate, deciduous leaves. Flowers bibracteate. Capsule apparently 4-celled, from the projecting placentæ.

D. TRI'FIDA. *Mœnch.* D. Tournefortii. *Mx.* D. Canadensis. *Mh.*

Leaves on short stalks, ovate-acuminate; *capsule* attenuate above; *racemes* axillary and terminal, 1—3-flowered. A shrub, 2 feet high, branching, with greenish yellow, somewhat irregular flowers, in small clusters. Stamens and style much exserted. Stigma capitate. Jn. *Bush Honeysuckle.*

3. TRIO'STEUM.

Calyx tube ovoid, limb 5-parted, segments linear, nearly as long as the corolla; corolla tubular, gibbous at base, limb 5-lobed, subequal; stamens 5, included; stigma capitate, lobed; fruit drupaceous, crowned with the calyx, 3-celled, 3-seeded; seeds ribbed, bony.

Gr. τρεις, three, οστεον, a bone; on account of its 3, hard, bony seeds. Perennial herbs (rarely suffruticose).

T. PERFOLIA'TUM.

Leaves oval acuminate, connate; *flowers* axillary, verticillate or clustered. A coarse, unattractive plant, growing in rocky woods. Stem simple, stout,

erect, round, hollow, 3—4 feet high, covered with soft, clammy hairs. Leaves six inches in length and three in width, entire, abruptly contracted at base, yet always connate, nearly smooth above, pubescent beneath. Flowers sessile, in clusters of 5 or 6. Corolla dull purple, viscid-pubescent, the limb in five rounded lobes. Fruit a rather dry drupe, somewhat 3 sided, crowned with the long, leafy, spreading calyx segments, orange-colored when mature, containing 3 bony nuts or seeds. June. The root is large and fleshy, and in much repute in medicine, having many of the properties of Ipecacuanha, both as emetic and cathartic. *Feverwort.*

4. SYMPHORICA'RPUS.

Calyx tube globose, limb 4—5-toothed; corolla funnel-shaped or bell-shaped, the limb in 4—5 subequal lobes; stamens 4—5, inserted on the corolla; stigma capitate; berry globose, 4-celled, 2-seeded (2 opposite cells abortive).

Gr. συν, together, φερω, to bear, καρπος, fruit; that is, a plant which bears its fruit collected in compact bunches. Small shrubs, with entire leaves and small flowers.

S. RACEMO'SUS. *Mz.* Symphoria racemosa. *Pers.*

Flowers in terminal, loose, interrupted, often leafy racemes; *corolla* campanulate, densely bearded within; *style* and *stamens* included. A smooth, handsome shrub, 2—3 feet high, common in cultivation, and native in Western N. Y., Canada, &c. Leaves oval or oblong, the margin often wavy, nearly or quite smooth, paler beneath, on short petioles. Corolla rose-color, the throat filled with hairs. Berries large, round or ovoid, of a snowy white and very ornamental when mature. July. Aug. *Snow-berry.*

5. LINNÆ'A.

Calyx tube ovate, limb 5-parted, deciduous; bracteoles at base, 2; corolla campanulate, limb subequal, 5-lobed; stamens 4, 2 longer than the other 2; berry dry, 3-celled, indehiscent, 1-seeded (2 cells abortive).

Named by Gronovius, in honor of Carl von Linne, the most profound naturalist of his own, or, perhaps, of any other times. A trailing, evergreen herb, widely diffused throughout the Northern Temperate Zone.

L. BOREA'LIS.

The only species, native of moist, shady, rocky soils, generally in evergreen woods. It has long, creeping, filiform, brownish stems, rooting and branching their whole length, and covering the ground in large patches. Leaves small, opposite, petiolate, roundish, with obtuse lobes or teeth and scattered hairs. Peduncles filiform, slightly hairy, about 3 inches high (the only erect part of the plant), the lower part leafy, the upper furnished with a pair of minute, linear, opposite bracts and terminating with 2, pedicellate, nodding flowers. The corolla is rose-colored and very fragrant. Jn. *Twin-flower.*

TRIBE 2, SAMBUCEÆ.

Corolla regular, rotate. Stigmas 3—5, nearly sessile.

6. SAMBU'CUS.

Calyx 5-parted; corolla 5-cleft; stamens 5; berry pulpy, 3-seeded.

Lat. *sambuca*, a musical instrument, said to have been made of the Elder. Shrubs or perennial herbs, with pinnate or bipinnate leaves. Flowers in cymes. Cal. small. Cor. concave, the seg. obtuse. Fil. long as cor. Style 0. Stig. obtuse, small, sessile. Berry globular.

1. S. CANADE'NSIS.

Stem shrubby; *cymes* 5-parted; *leaves* nearly bipinnate; *leaflets* oblong-oval, acuminate, smooth. A common, well known shrub, 6—10 feet high, in thickets and waste grounds. Stem filled with a light and porous pith, especially when young. Leaflets in 3 or 4 pairs with an odd one, serrate, the lower ones often binate or trifoliate. Petioles smooth. Flowers numerous, in very large, level-topped cymes, white, with a heavy odor. Berries dark purple. May—July. *Common Elder.*

2. S. PUBENS.

Stem shrubby; *cymes* paniculate or pyramidal; *leaflets* oval-lanceolate, acuminate, in 2 or 3 pairs with an odd one, and, with the petiole, pubescent beneath. A common shrub, in hilly pastures and woods, growing about 6 feet high, often more or less. Leaves simply and unequally pinnate. Leaflets sharply serrate, very pubescent when young. Flowers in a close, ovoid thyrsus or panicle. Corolla white. Berries scarlet, small. Jn. *Panicled Elder.*
β. leucocarpa, berries white. Catskill Mountains. *T. & G.*

7. VIBU'RNUM.

Calyx 5-toothed; corolla 5-lobed; stamens 5; drupe 1-seeded.

Lat. *viere*, to tie; on occount of the pliability of the twigs of some of the species. A genus of shrubs or small trees, several of them ornamental. Leaves petiolate. Flowers cymose. Cal. minute. Cor. somewhat bell-shaped, the segments obtuse. Fil. long as corolla. Style 0.

* Cymes radiant, the marginal flowers much larger than the others and neutral.

1. V. LANTANOI'DES.

Leaves orbicular-cordate, abruptly acuminate, unequally serrate; *petioles* and *veins* covered with a ferruginous down; *cymes* sessile; *fruit* ovate. A shrub, very ornamental when in flower. It is rather common in the rocky woods of N. Eng. and N. Y., which it adorns in early spring with its large cymes of brilliant white flowers. Hight about 5 feet. Branches long and crooked, often trailing and rooting. Leaves very large, covered with a rusty pubescence when young, at length becoming green, the dust and down remaining only upon the stalk and ribs. The radiant, sterile flowers of the cyme are near an inch in diameter, from a greenish color becoming white, flat, with 5, rounded lobes. Inner flowers much smaller, fertile. May.
Hobble-bush.

2. V. O'PULUS. *L.* V. Oxycoccus. *P.*

Smooth; *leaves* 3-lobed, 3-nerved, rather acute at base, the lobes divaricate, acuminate, toothed; *petioles* glandular; *cymes* pedunculate. A handsome shrub, 8—12 feet high, in woods and borders of fields. Stems several from the same root, branched above. Leaves with large, remote, blunt teeth, the stalks with 2 or more glands at base, channelled above. Cymes bordered with a circle of large, white, barren flowers, like the preceding species. Fruit resembles the common cranberry in flavor, and is sometimes substituted for it. It is red, very acid, ripens late, remaining upon the bush after the leaves have fallen. June. *High Cranberry.*

β. roseum; flowers all neutral, in globose cymes. This variety is the popular shrub so generally admired and cultivated as a companion of the Lilac, Snowberry, Philadelphus, &c. Its dense, spherical cymes are wholly made up of barren flowers. *Guelder Rose. Snowball.*

* * Cymes not radiant. Flowers all simliar and fertile. Leaves lobed or incised.

3. V. ACERIFO'LIUM.

Leaves subcordate, acuminate, 3-ribbed, 3-lobed, acutely serrate; *petioles* without glands; *cymes* on long peduncles. A shrub, 4—6 feet high, with yellowish green bark, growing in woods. Leaves broad, rounded and sometimes cordate at base, divided into 3 acuminate lobes with sharp serratures, a form not very unlike that of the Maple leaf, the under surface, as well as the younger branches a little downy. Branches straight, slender, very flexible, ending with a pair of leaves and a long-stemmed, cymose umbel of white flowers. Fruit oval, compressed. Stamens much exserted. Jn.
Dockmackie. Maple-leaved Viburnum.

4. V. PAUCIFLO'RUM. *Pylaie.*

" *Leaves* roundish, slightly 3-lobed or incised at the summit, mostly 5-ribbed from the base; *cymes* small and pedunculate, terminating the very short, lateral branches; *filaments* much shorter than the corolla. White Mts. N. H. and Mansfield Mt. Vt." *T. & G.* A small shrub, nearly smooth in all its parts. Flowers white.

* * * Cymes not radiant. Flowers all fertile. Leaves undivided, toothed.

5. V. LE'NTAGO.

Leaves ovate, acuminate, acutely and finely serrate; *petiole* margined, undulate. A common tree-like shrub, in rocky woods. Hight 10—15 feet. Leaves smooth, about 3 inches long and about half as broad, their stalks with a curled or wavy, dilated border on each side. Flowers white, in broad, spreading cymes, succeeded by well-flavored, sweetish berries of a glaucous black. June. *Sweet Viburnum.*

6. V. NUDUM.

Smooth; *leaves* oval-oblong, revolute at the edge, subcrenulate; *petioles* naked; *cymes* pedunculate. A shrub or small tree, 10—15 feet high, in swamps. Leaves elliptical, punctate, coriaceous, the margin more or less rolled, nearly entire, smooth as well as every other part, and when full grown, 3 or 4 inches long. Cymes large, on peduncles an inch or two in length, with caducous bracts. Flowers numerous, white. Berries dark blue, covered with a glaucous bloom, sweetish when ripe. Jn. *Naked Viburnum.*

β. cassinoides (V. pyrifolium. *Lam.*); *leaves* ovate, somewhat acute, subserrate; *cymes* sub-pedunculate. Shrub 5—10 feet high, smooth. Leaves with small, irregular serratures, generally ovate, but often oval and even rhomboidal, generally ending in an obtuse point, but often acute, acuminate and even emarginate on the same twig. Cymes on peduncles an inch in length. Fruit oblong-ovate, dark glaucous blue.

7. V. PRUNIFO'LIUM.

Leaves smooth, roundish-obovate, acutely serrate, with uncinate teeth; *petioles* margined with straight, narrow wings. In woods and thickets. A shrub or small tree, 10—20 feet high, the branches spreading, some of them often stinted and naked, giving the plant an unthrifty aspect. Leaves about 2 inches long and nearly as wide, on short petioles, slightly margined. Cymes rath-

er large, terminal, sessile. Flowers white, succeeded by oval, blackish berries which are sweet and eatable. Jn. *Black-Haw. Sloe.*

8. V. DENTA'TUM.

Nearly smooth; *leaves* roundish-ovate, dentate-serrate, subplicate, on long stalks; *cymes* pedunculate. A shrub, 8—12 feet high, not uncommon in our damp woods and thickets. It is called arrow-wood from the long, straight, slender branches or young shoots. Leaves roundish, 2 or 3 inches in diameter, the upper pair oval, the ribs beneath prominent, parallel and pubescent in their axils. Flowers white, succeeded by small, roundish, dark blue berries. June. *Arrow-wood.*

9. V. PUBE'SCENS.

Leaves ovate, acuminate, dentate-serrate, subplicate, villous beneath and somewhat hairy above, on short stalks; *stipulae* 2, subulate; *cymes* pedunculate; *fruit* oblong. In dry, rocky woods and thickets. A shrub, about six feet high. Leaves about 2 inches long, each with a pair of short, hairy, subulate appendages (stipular?) at the base of the very short petiole. Cymes small, few-flowered. Flowers rather larger than those of the foregoing species, white. June. *Downy Viburnum.*

10. V. TINUS.

Leaves ovate, entire, their veins with hairy tufts beneath. An exceedingly beautiful evergreen shrub, from Europe. Hight 4—5 feet. Leaves acute, veiny, dark shining green above, paler beneath. Flowers white, tinged with red, very showy. Degrees of pubescence variable. *Laurestine.*

ORDER LXXIII. RUBIACEÆ. *The Madder Tribe.*

Cal.—Tube more or less adherent (superior or half-superior), limb 4—5-cleft.
Cor.—Regular, inserted upon the calyx tube, and of the same number of divisions.
Sta.—Inserted upon the tube of corolla, equal in number and alternate with its segments.
Ova.—2- (rarely more) celled. *Style* single or partly divided.
Fr.—Various. *Seeds* one, few or many in each cell.

An extensive order of trees, shrubs and herbs. Leaves opposite, sometimes verticillate, entire and furnished with stipules. It is generally divided into two Suborders, viz., STELLATÆ and CINCHONEÆ, to which a third, LOGANIEÆ (which has no representatives at the North) is appended by Torrey and Gray.

The species of the first Suborder, Stellatæ, are common in the northern parts of both continents; the two other Suborders chiefly prevail in warm or torrid regions.

Properties. A very important family, furnishing many useful products. The *madder*, one of the most important of dyes, is furnished by the root of Rubia tinctoria. A similar coloring matter is possessed by several species of Galium. Among the CINCHONEÆ we find Cinchona and Cephælis, furnishing two of the most valuable of all medicines. *Peruvian bark*, a powerful febrifuge, well known and appreciated everywhere, is the product of several species of the former, viz. Cinchona micranthia, C. condaminea, C. lanceolata, C. magnifolia, &c. all natives of Peru. Their febrifugal properties depend upon the presence of two alkalies, *Cinchonia* and *Quinia*, both combined with *Kinic acid*. *Ipecacuanha*, the prince of all emetics, is the product of the root of Cephælis Ipecacuanha, a little shrubby plant with creeping roots, in the damp forests of Brazil. Several other species of Cinchoneæ afford substitutes for the true ipecac.

Coffee is the hard albumen of the seeds of Coffea Arabica, a tree of moderate size, with a light brown trunk and a conical shaped head. Leaves shining, light green. Flowers white, fragrant. The berries are black when ripe. Coffee is said to have been used in Ethiopia from time immemorial. In Paris and London it seems not to have been in general use earlier than the year 1700, but since that time, enough has been drank in Europe and America to float the British navy.

Conspectus of the genera.

Herbs.	Flowers terminal, the ovaries united.	*Mitchella.*	2
	Leaves opposite. Flowers solitary or clustered.	*Hedyotis.*	3
	Leaves verticillate. Styles two.	*Galium.*	1
Shrubs	Flowers densely aggregate in a globose head.	*Cephalanthus.*	4
	Flowers solitary, very large. Exotic.	*Portlandia.*	5

SUBORDER 1, STELLATÆ.

Calyx wholly adherent (superior) to the ovary which is two-celled, two-seeded. Leaves verticillate. Herbs.

1. GALIUM.

Calyx 4-toothed, very small; corolla rotate 4-cleft; stamens 4, short; styles 2; carpels 2, united, 1-seeded, indehiscent.

Gr. γαλα, milk; because the flowers of one species (G. verum) are used in coagulating milk. A very neutral genus of herbs with square stems.

* Fruit smooth.

1. G. VERUM.

Erect; *leaves* 8 in a whorl, grooved, entire, rough; *flowers* in dense clusters. Grows in dry, sunny soils, supposed to have been introduced from Europe. Root long, fibrous. Stem slender, erect, 1—2 feet high, with short, opposite, leafy, unequal branches; leaves deflexed, linear, with rolled edges. Flowers numerous, small, yellow, in small, dense, terminal panicles. The roots dye red. The flowers are used in England to curdle milk. Jn. Per.
Yellow Bedstraw.

2. G. ASPRE'LLUM.

Diffuse; *stems* rough backwards, very branching; *leaves* 6 in a whorl, lanceolate, slender at the point; *pedicels* very short. Common in thickets and low grounds. Stem weak, supported by other plants to which it closely adheres by its sharp, minute, retrorse prickles. Flowers white, very small and numerous, followed by a very minute, smooth fruit, which is often somewhat hispid when young. July. Per. *Rough Cleavers or Clivers.*

3. G. TRI'FIDUM.

Stem decumbent, very branching, roughish with retrorse prickles; *stem leaves* in 5s, *branch leaves* in 4s, all linear, obtuse, rough-edged; *corolla* mostly trifid. Found in low grounds. It is one of the smallest of the species, sufficiently distinguished by the minute corolla being often but 3-cleft and with but 3 stamens. Leaves broad linear. Hight 6—15 inches. Jl. Per.
Dyers' Cleavers.

β. *tinctorium* (G. tinctorium. *L.*); *stem* nearly smooth; *leaves* of the stem in 6s, of the branches in 4s; *peduncles* 2--3-flowered; *lobes* of the corolla, and the *stamens*, 4. A somewhat stouter variety than the above. The root is said to dye a permanent red.

γ. *latifolium* (*Torr.* G. obtusum. *B.*); *stem* diffuse; *leaves* in 4s, oblanceolate, obtuse, rough on the edge and mid-rib. Leaves very obtuse, broadest above the middle. Flowers in 3s. Corolla segments and stamens, 4.

* * Fruit hispid.

4. G. BOREA'LE.

Stem erect, square, smooth; *leaves* in 4s, linear-lanceolate, acute, rough on the margin and mid-rib; *panicle* terminal, pyramidal. Stems a foot high, with numerous, branched panicles of white flowers at or near the top. Leaves 1—2 inches long, lanceolate, often broadly so. Grows in shady and rocky places. July. Perennial. *Northern Galium.*

5. G. APARI'NE.

Stem weak; *leaves* 6--8 in a whorl, lanceolate, obovate, keeled rough. A common plant, in wet thickets. The specific name is from απαιρω, to lay hold

of, because the whole plant, stem, leaves and fruit, being beset with reflexed bristles, adheres to every thing in its way. Stem leaning on other plants. Flowers numerous, small, white. The root will dye red, and when eaten by birds is said to tinge their bones red. The herb is highly valued and carefully stored by the thoughtful house-wife, for sundry medicinal purposes, it being thought to purify the blood and heal cutaneous eruptions. Flowers in June. Annual. *Common Cleavers.*

6. G. CIRCÆ'ZANS.

Stem erect or ascending, smooth; *leaves* in 4s, oval, acute, smoothish, ciliate on the margin and nerves; *peduncles* few-flowered, divaricate; *fruit* hispid with hooked bristles. Grows in woods. Stems about a foot in hight, with a few opposite branches near the top. Leaves 1—2 inches long. Flowers on very short, reflexed pedicels, scattered along the (usually 2) branches of the dichotomous peduncle. Fruit covered with little hooks as in Circæa. The leaves have a sweet taste like Liquorice. Jl. Per.
Cross-leaved Galium. Wild Liquorice.

β. *lanceolatum* (*Torr.*); very smooth; *leaves* lanceolate, acute, 3-nerved, margin subciliate; *fruit* subsessile, nodding. A fine variety with larger leaves (2 or more inches in length). Flowers purple, in divaricate panicles. Plant a foot high.
γ. *montanum* (*Oakes*); dwarf; *leaves* obovate. White Mts. *T. & G.*

7. G. TRIFLO'RUM.

Stem weak, procumbent, smoothish, shining; *leaves* in 5s and 6s, lanceolate, acuminate-cuspidate, 1-nerved, scarcely ciliate on the margin; *branches* 3-flowered at the extremity; *flowers* pedicellate, white; *fruit* hispid with hooked hairs. Grows in moist thickets. Well distinguished by its trichotomous peduncles which are both axillary and terminal. Leaves tapering to the base, often obovate, 1—2 inches long. Flowers greenish-white, small. July. Per. *Three-flowered Galium.*

8. G. PILO'SUM.

Stem nearly simple, ascending, hirsute; *leaves* in 4s, oval, nerveless, very hirsute both sides and punctate with pellucid dots; *peduncles* several times forked, each division about 3-flowered; *flowers* pedicellate. A rare species found in dry woods and sterile soils. Stem about 1 foot high, acutely 4-angled, with few short, spreading branches. Leaves an inch or more in length, obtuse, and very hairy as well as the stem and fruit. Flowers purplish white. June. Per. *Hairy Galium.*

SUBORDER 2, CINCHONEÆ.

Calyx adherent to the ovary. Leaves opposite (rarely verticillate), stipulate.

2. MITCHE'LLA.

Flowers 2 on each double ovary; calyx 4-parted; corolla funnel-shaped, hairy within; stamens 4, short, inserted on the corolla; stigmas 4; berry composed of the 2 united ovaries.

Name in honor of John Mitchell, an English botanist who traveled in Virginia and wrote certain papers on North American plants. Evergreen herbs, smooth and creeping, with opposite, roundish leaves.

M. REPENS.

Stem creeping; *leaves* roundish-ovate, petiolate. A little prostrate plant found in woods throughout the U. S. Stem furnished with flat, coriaceous, dark green leaves, and producing small, bright red berries, remarkably distinguished by their double structure, and remaining on the plant through the winter until the following spring. The corollas are white or tinged with red, very fragrant. Fruit well flavored but dry and full of stony seeds. Jn. Per. *Partridge Berry.*

3. HEDYO'TIS.

Calyx tube ovate, limb 4-parted; corolla 4-lobed; stamens 4, inserted on the corolla; stigma 2-lobed; capsule 2-celled, many-seeded.

Gr. ἡδυς, sweet, (ους) οτος, the ear; said to cure deafness. A genus (*T. & G.*) embracing the Hedyotis, Houstonia and Oldenlandia of Linn. Herbs, rarely shrubs. Leaves opposite. Stipules connate with the petiole.

* Corolla rotate, tube very short.

1. H. GLOMERA'TA.

Stem assurgent, branching; *leaves* oblong-lanceolate, pubescent, narrowed at the base into a short petiole or sessile; *flowers* glomerate in the axils and terminal. A plant varying in size from 1—2 inches to as many feet, found in swamps, &c. N. Y. Leaves half an inch in length, apparently connate from the stipules adhering to each side of the petiole. Stipules 2-cleft, into narrow subulate divisions. Calyx in 4 deep, leafy divisions which are much longer than the white, rotate corolla. Stamens scarcely exserted. Style very short. Capsule opening crosswise. Jn.—Sept. Ann. *Creeping Green-head.*

* * Corolla tube longer than the calyx segments.—HOUSTONIA.

2. H. CŒRU'LIA. *Hook.* Houstonia cœrulia. *L.*

Corolla hypocrateriform; *radical leaves* ovate-spathulate, petiolate; *stems* erect, numerous, dichotomous; *peduncles* filiform, 1—2 flowered. An elegant little plant, found in moist grounds, fields and road-sides. Its blossoms appear early and are usually found in patches of considerable extent, covering the surface of the ground with a *cœrulian* hue. The cauline leaves are small, opposite, lance-ovate. Stems very slender, forked, 3--5 inches high, each branch bearing a flower. Corolla pale blue, yellowish at the centre. May—June. Per. *Dwarf-pink. Innocence.*

3. H. CILIOLA'TA. *Torr.* Hous. Canadensis. *Mh.*

Corolla infundibuliform; *Radical leaves* ovate, obtuse, narrow at the base, ciliate on the margin; cauline ones ovate-spathulate, sessile; *corymbs* terminal, pedicellate; *peduncles* trichotomous; divisions of the *calyx* lance-linear. Banks of lakes and rivers; Ontario, Niagara. A little plant about the size of the last. Root leaves numerous, stem leaves few. Stems smooth, 4-angled, branched above and bearing a corymbose cluster of numerous pale purple flowers. Calyx half-adherent, its lobes about half as long as the tube of the corolla. May—July. Per. *Clustered Dwarf-pink.*

4. H. LONGIFO'LIA. *Hook.* Hous. longifolia. *Gaert.*

Corolla infundibuliform; *radical leaves* oval, narrowed at each end; *stem leaves* linear, 1-nerved; *flowers* corymbed or paniculate. Stem erect, 5—10

inches high, numerous, 6-angled, with smooth, opposite obtusish, narrow leaves, corolla tubular, the limb divided into 4 acute segments, of a pale purple, with deeper colored striae in the throat. Dry hills, &c. Jn. Per.

Long-leaved Dwarf-pink.

4. CEPHALA'NTHUS.

Calyx limb 4-toothed; corolla tubular, slender, 4-cleft; stamens 4; style much exserted.

Gr. κεφαλη, head, ανθος, flower; because the flowers grow in dense heads. Shrubs with opposite leaves and short stipules.

C. OCCIDENTA'LIS.

Leaves opposite and in threes, oval, acuminate. A handsome shrub frequenting the margins of ponds, rivers and brooks. It is readily distinguished by its spherical heads of flowers, which are near the size of a musket ball, resembling the globular inflorescence of the sycamore (Platanus accidentalis). Hight about six feet. Leaves spreading, entire, pointed. The flowers are tubular, with long projecting styles, and are inserted on all sides of the round receptacle. Flowers in July.

5. PORTLA'NDIA.

Calyx 5-parted; corolla clavate, infundibuliform, the border 5-cleft, reflexed; stamens 5; capsule 5-cornered, retuse, crowned, 2-celled, 2-valved; valves double, 2-cleft, many-seeded.

In honor of the Duchess of Portland, a patroness of botany. Spendid exotics, native of Jamaica.

P. GRANDIFLO'RA.

Leaves elliptic-lanceolate. A splendid flowering shrub of easy culture. Stem slender, several feet in length, smooth. Leaves opposite, entire, of a fine dark, shining green, very smooth, a span long. Flowers white 10 inches in length, trumpet-shaped, the border expanding 3 inches. The tube is angular, at first buff-colored. Calyx leaves ovate, tinged with red. Peduncles short, axillary, solitary. Flowers highly fragrant. Jn.—Aug.

Large-flowered Portlandia.

ORDER LXXIV. VALERIANACEÆ.

Cal.—Adherent, the limb either membranous or resembling pappus.
Cor.—Tubular or funnel-form, 4—5-lobed, sometimes spurred at base. [lobes
Sta.—Distinct, inserted into the corolla tube, alternate with, and generally fewer than its
Ova.—Inferior, with one perfect cell and two abortive ones.
Sds.—Solitary, pendulous, in a dry, indehiscent periearp.

A small family of herbs, widely diffused in temperate climates. Leaves opposite, with no stipules. The true *valerian* of the shops, used in hysteria, epilepsy, &c., is a product of Valeriana officinalis. The roots of several other species possess a heavy odor and are tonic, antispasmodic, febrifugal, &c. The *spikenard* (John 12: 3, &c.) of old, valued as a perfume and a stimulant, is from the root of Nardostachys Jatamansi.

Genera.

Limb of the calyx at length a plumose pappus, deciduous. . . .	*Valeriana.*	1
Limb of the calyx toothed and persistent, or obsolete.	*Fedia.*	2

1. VALERIA'NA.

Calyx at first very small, at length forming a plumose pappus; corolla funnel-form, regular, 5-cleft; stamens 3; fruit 1-celled, 1-seeded.

Lat. *valere*, to be well; on account of its salutary medicinal properties. Perennial herbs, with the flowers in close cymes.

1. V. SYLVA'TICA. *β. uliginosa.*

Stem erect, striate, simple; *radical leaves* ovate or subspathulate, undivided, cauline ones pinnately divided, segments ovate-lanceolate, entire or subserrate; the terminal one often dentate; *lobes* of the *stigma* minute, 2 or 3; *fruit* ovate, compressed, smooth. Stem 1—2 feet high. Swamps. The plant is nearly smooth, leaves ciliate with scattered hairs. Those of the root petioled, sometimes auriculate at base, those of the stem with 4—8 lateral segments and a large terminal one. Flowers numerous, rose-colored, appearing in July. *Wild Valerian.*

2. V. PHU.

Radical leaves entire, cauline ones pinnate; *stem* smooth and slender. Native of Germany. Cultivated for its medicinal virtues, it being administered for hysteria, habitual costiveness, &c. Cats are singularly delighted with the roots. The Arabic name of this plant is Phu. Grows about 3 feet high. Flowers white. May—July. *Garden Valerian.*

V. officinalis, great valerian, has all the leaves pinnate. Virtues similar to the last. *V. tuberosa*, has tuberous roots and entire, lanceolate radical leaves.

2. FE'DIA.

Calyx limb 3—6-toothed and persistent, or obsolete; corolla tubular, 5-lobed, regular; stamens 2 or 3; fruit 2 or 3-celled, 1-seeded.

An arbitrary name apparently without meaning. Annual herbs with opposite, sessile leaves. One or two cells of the fruit abortive.

F. FAGOPY'RUM. *T. & G.* Valerianella radiata. *Beck.*

Stem dichotomous, nearly smooth; *leaves* oblong-spathulate, subentire; *fruit* 3-sided, obscurely 2—3-toothed at the summit. Western N. Y., &c. Stem 8—18 inches in hight. Bracts lanceolate, acute. Fruit resembling that of buck-wheat (Polygonum Fagopyrum) in form, containing one large seed and two empty cells. Flowers white. June.

Corn Salad. Lamb Lettuce.

ORDER LXXV. DIPSACEÆ. *The Teasel Tribe.*

Cal.—Adherent, often pappus-like, surrounded by a scarious involucel.
Cor.—Tubular, somewhat irregular, the limb 4—5-parted.
Sta.—4, alternate with the lobes of the corolla, often unequal. *Anthers* distinct.
Ova.—Inferior, one-celled, one-ovuled. *Style* one, simple.
Fr.—Dry, indehiscent, with a single suspended seed.

Herbs or low shrubs, with whorled or opposite leaves. Flowers collected upon a common receptacle and surrounded by a many-leaved involucre. The order is nearly allied to the Compositæ. The species are all natives of the temperate regions of the Eastern continent, none of them American. Their properties are unimportant. One of the species below is useful in dressing cloth.

1. DI'PSACUS.

Flowers in heads; involucre many-leaved; involucel 4-sided; calyx superior; corolla tubular, 4-cleft; fruit 1-seeded, crowned with the calyx.

Gr. δίψακος, teasel, from δίψαω, to thirst, in allusion to the water which collects in the axils of the concave leaves. This water once had a reputation as a cosmetic. Large, biennial herbs, hairy or prickly. Leaves opposite, connate (sometimes distinct) at the base. Outer lobe of cor. largest. Fil. longer than cor. Sty. equal to the cor.

1. D. SYLVE'STRIS.

Leaves connate, sinuate or jagged; *heads* cylindrical; *bracts* of the involucre longer than the head of flowers, slender and pungent, bent inwards. A tall, naturalized, European plant, growing in hedges and by road-sides. Stem about 4 feet high, angled and prickly, with the opposite, lance-shaped leaves united around it. Flowers bluish, in a large oval or cylindrical head whose bracts or scales are not hooked as in the next species, but straight. July.

Wild Teasel.

2. D. FULLO'NUM.

Leaves connate, entire or serrate; *head* cylindrical; *bracts* hooked; *involucre* spreading. A cultivated, European plant. Root fleshy, tapering. Stem erect, furrowed, prickly, hollow, about 5 feet high. Leaves two at each node, united at their bases around the stem in such a way as to hold a quantity of water. Flowers whitish, in large, oval or ovoid heads. It is cultivated for the use of the clothiers (*fullonum*), who employ the heads with their hard, hooked scales to raise the nap upon woollen cloths. For this purpose they are fixed around the circumference of a revolving drum. Flowers in July.

Fuller's Teasel.

Seabiosa is another genus of this order, consisting of coarse, hardy plants with aggregated flowers, a few of which, as *S. succisa*, with a premorse root and equal blue flowers; *S. atropurpurea*, with deep, dark purple flowers in radiant heads; *S. stellata*, with sky blue flowers in radiant heads, are rarely found in cultivation.

ORDER LXXVI. COMPOSITÆ. *The Aster Tribe.*

Flowers collected into a dense head (capitum), upon a common receptacle, surrounded by an involucre of many bracts (scales).

Cal.—Closely adherent to the ovary, the limb wanting, or membranaceous and divided into palæ, bristles, hairs, &c. called *pappus*.

Cor.—Superior, consisting of 5 united petals, either ligulate or tubular.

Sta.—5, alternate with the lobes of the corolla. *Anth.* cohering into a cylender.

Ova.—Inferior, 1-celled, 1-ovuled. *Style* 2-cleft, the inner margins of the branches occupied by the stigmas.

Fr.—An achenium, dry, indehiscent, 1-seeded, crowned with the pappus.

This is the most extensive and most natural of all the orders of the vegetable kingdom, always distinguished at sight by the capitate flowers and the united anthers. It comprehends about one tenth of the species of flowering plants. They are mostly herbs, (rarely shrubs or trees), with alternate or opposite leaves, which are generally simple. The general inflorescence is centrifugal, that is, the central or terminal heads are first developed, while the inflorescence of the heads is centripetal, the outer flowers first expanding. In color the flowers are various; sometimes those of the disk and ray are of different colors, again they are all of the same, but in the former case the disk florets are almost always yellow.

This immense order is diffused throughout all countries of the globe, but in very different proportions. According to Humbolt, they constitute about one seventh of the Phænogamous Flora of Germany, one eighth, of France, one fifteenth, of Lapland, one sixth, of North America (north of Mexico), and one half, of Tropical America. In New Holland they are in the proportion of about one sixteenth, according to Brown, while in the Island of Sicily they are one half. The Liguliflorœ are said to be most abundant in cold regions, and the Tubuliflorœ in hot regions. The Labiatifloræ are almost exclusively confined to South America. In the northern parts of the world the Compositæ are universally herbaceous, but towards the tropics they gradually become frutescent and even trees. In Chili they are generally shrubs, and on the Island of St. Helena they are trees.

Properties, &c. The Compositæ furnish comparatively few useful products. A bitter principle pervades the whole, which, when combined with resin and astringent mucillage, becomes *tonic* and *febrifugal*, as in the camomile, colts-foot, thoroughwort, goldenrod, &c. Some are *anthelmintics* from the prevalence of the resinous principle, as tansey, Artemisia, Vernonia. Others are aromatic and extremely bitter, as wormwood and all the species of Artemisia. Other species are very acrid, as mayweed. The Jerusalem artichoke (Helianthus tuberosus), the vegetable oyster (Tragopogon), the true artichoke (Cynara), lettuce, dandelion and a few others, are the only species useful for food. The order abounds in ornamental plants of the highest interest to the florist, and of easy culture. Among these are the splendid Dahlias and Chinese Chrysanthema, with the numerous progeny of Aster, Helianthus, Xeranthemum, Coreopsis and multitudes of others, constituting the richest ornaments of the autumnal flower garden.

The inflorescence of the Compositæ is peculiar, and its real nature often complex and obscure. The following definitions of terms are given with reference to this order only, and if understood, will remove many difficulties that lie in the student's way in the investigation of this subject.

Capitum or *head* (*compound flower* of the earlier botanists); a collection of flowers (*florets*) on a common receptacle (*rachis*), as in Aster, Helianthus, &c.

Involucrum (*calyx* by analogy) is the lower and outer envelope of the head.

Scales; the modified leaves or bracts composing the involucrum.

Monophyllous involucrum: where the scales are united by thin edges.

Polyphyllous involucrum; where the scales are distinct.

Simple involucrum; where the scales are equal and arranged in a single row.

Calyculate involucrum; where a single row of scales is surrounded at base by an outer row of very short ones.

Imbricated involucrum; where the scales are in several rows, the outer ones becoming gradually shorter.

The *Receptacle* or *rachis* is the dilated extremity of the peduncle, inclosed by the involucrum, and upon which the flowers stand. It is

Columnar, flat, conical or *depressed*, according to its form;

Paleaceous or *chaffy*, where the flowers are subtended by chaffy scales which are analagous to bracts;

Alveolate, where it presents the appearance of a honey-comb, each flower having been surrounded by a membranous rim or involucel;

Areolate, where the alveoli, are reduced to a mere line;

Fimbrillate, where the alveoli are split into teeth or bristles;

Naked, when smoothish, being destitute of chaff, alveoli, bristles, &c.

The FLOWERS are moreover said to be

Of the disk, where they stand in or near the centre of the head;

Of the ray, when they stand in the outer circle or circumference of the head;

Ligulate (strap-shaped), when the limb is split on one side and spread open in the form of a strap;

Tubular, when they are monopetalous with a regular limb. The HEADS are termed

Homogamous, where they consist wholly of perfect flowers;

Heterogamous, where the flowers of the disk are perfect or staminate, while those of the ray or margin are pistillate or neutral;

Ligulate, where the flowers are all ligulate, as in the dandelion;

Radiate, where those of the ray or margin only are ligulate, the rest being tubular, as in the Aster;

Discoid, where all the flowers are tubular, as in the thoroughwort;

Monœcious, where the same head has both staminate and pistillate flowers;

Heterocephalous, where the same individual plant has some of its heads wholly of staminate, and others wholly of pistillate flowers.

Diœcious, where the same species has some of its individuals with staminate heads only, and others with pistillate heads only. The ANTHERS are usually *appendiculate*, that is, prolonged at the summit into a membranous appendage. The ACHENIA are termed *rostrate*, when they are prolonged at the summit into a slender neck supporting the pappus, as in the dandelion.

The Compositæ, both entire and in portions, have recently been made the subject of many profound and elaborate treatises, among which are those of Cassini, Brown, Lessing, Nees von Esenbeck and DeCandolle. But the North American Compositæ of Torrey and Gray is a work so authentic, full and clear in its arrangement and nomenclature as to leave little to be desired by the student in this deeply interesting family.

Conspectus of the Genera.

SUBORDER I, TUBULIFLORÆ.

Corolla of the perfect flowers tubular, regular, 5-toothed or lobed.

Section I. Heads discoid.

- Flowers not yellow.
  - Leaves alternate.
    - Unarmed.
      - Flowers all perfect.
        - Scales imbric.
          - green. — Pappus capillary. . *Vernonia.* 1
          - colored. Stems winged. . Pappus plumose. . *Liatris.* 4
        - Scales in one row. . . . . Pappus capillary. . . . . *Cacalia.* 40
        - Pappus chaffy. . . . *Stevia.* 6
      - Fls. not all perfect.
        - Scales colored.
          - Recep. not chaffy. . . . . Hds heterogamous. *Gnaphalium.* 42
          - Receptacles chaffy. . . Heads diœcious. *Antennaria.* 43
        - Scales green.
          - Herbs
            - Ray flowers
              - small. fert. — Scales calyculate *Erechtites.* 39
              - Scales imbricate. *Pluchea.* 18
            - Ray flowers large, sterile. *Centaurea.* 48
          - Shrubby; heads diœcious. . . *Baccharis.* 19
    - Plants armed
      - with spinose leaves. . . . . Scls. acute. cuspid
        - Achenia smooth. *Circium.* 52
        - Ach. rugose, 4-angl *Onopordon.* 50
        - Scales emarginate-mucronate. . . *Cynara.* 51
      - with spinose heads only. . . . Hds. homogamous. *Lappa.* 53
        - Spines uncinate. . . Hds. heterocephalous. *Xanthium.* 55
        - Spines straight; involucre 1-flowered. *Echinops.*
  - Leaves opposite. . .
    - Fls. all perfect. .
      - Scales 8—50. *Eupatorium.* 2
      - Pappus capillary. . Scales 1—5. . *Mikania.* 3
      - Pappus of 5—10 chaffy scales. . . *Ageratum.* 5
    - Flowers not all perfect.
      - Heads monœcious. . . . *Iva.* 54
      - Heads heterocephalous. . *Ambrosia.* 56
- Flowers yellow.
  - Marginal corols small.
    - Scales unarmed,
      - dry.
        - Ach. crowned with a large disk. *Tanacetum.* 45
        - Ach. crowned with a small disk. *Artimisia.* 41
      - green, — in 2 series, the outer one leafy. *Bidens.* 37
    - Scales armed with spinose appendages. . *Cnicus.* 49
  - Marginal corollas large, sterile. . . . . *Centaurea.* 48

Section II. Heads radiate.

- Rays yellow.
  - Lvs. alternate.
    - Receptacl not chaffy;
      - flat or convex
        - Involucre imbricate.
          - Pappus simple
            - Hds. very large. *Inula.* 17
            - Heads small. *Solidago.* 15
          - Pap double; heads middl size. *Chrysopsis.* 16
        - Invol. not imbricate.
          - Outer scales very short or 0. *Senecio.* 38
          - Outer scales equal to the inner. *Calendula.* 47
      - conical or globose; outer row of scales longest. . *Helenium.* 23
    - Receptacle chaffy, conical. . . . . Achenia quadrangular. . . *Rudbeckia.* 23
      - Achenia compressed. . *Lepachys.* 24
  - Lvs. opposite.
    - Receptacle chaffy;
      - flat or convex.
        - Rays ster. disk perf. .
          - Invol. double, — Achenia with — erectly hispid awns. *Coreopsis* 36
          - retrorsely hisp. awns. *Bidens.* 37
        - Rays fertile, disk sterile. Achen. wingless. *Polymnia* 21
        - Invol. imbric. in 3 or more rows. *Helianthus.* 25
      - conical; rays fertile.
        - Outer scales spreading leafy. *Heliopsis.* 35
        - Outer scales appressed. . *Sanvitalia.* 26
    - Recept. not chaffy. .
      - Involucre of distinct scales in 2 rows. . *Arnica.* 20
      - Involucre of 5 united scales in 1 row. . *Tagetes.* 27
  - Leaves all radical, cordate, appearing after the solitary heads. . . *Tussilago.* 7
- Rays not yellow.
  - Leaves all radical. . . . . Heads corymbose, somewhat diœcious. . *Nardosmia.* 8
    - Heads solitary, heterogamous. . . . . *Bellis.* 13
  - Lvs. alternate.
    - Receptacl. not chaffy;
      - alveolate. . . .
        - Pap. simpl.
          - Ach. very silky. Rays about 5. *Seriocarpus.* 10
          - Ach. smoothish. Rays 6—100. *Aster.* 9
        - Pappus double; involucre imbricate. *Diplopappus.* 11
      - naked. .
        - Lvs. sinnate-lobed.
          - Involu. depressed. *Leucanthemum.* 32
          - Invo. hemispherical *Chrysanthemum.* 34
        - Lvs. not lobed; invol. sub-simple rays 50—200. *Erigeron.* 12
    - Receptacle chaffy. . . (Lvs. finely divided.)
      - Rays pistillate. . *Anthemis.* 29
      - Disk fls. yellow. . . . Rays neutral. . . *Maruta.* 30
      - Disk flowers white; rays pistillate. . . *Achillea.* 31
    - Lvs. opposite,
      - simple. .
        - Receptacle conical, with large palæ. . *Zinnia.* 22
        - Receptacle flat, (rays rose-color or white.) *Coreopsis.* 36
      - pinnate; inner involucre of 8 united scales. . . *Dahlia.* 14

Suborder II, LIGULIFLORÆ.

Flowers all ligulate and perfect, arranged in a radiant head. Juice milky and bitter.

Leaves radical..	Flowers yellow	Scales of the invol. equal; pappus double.	*Krigia.*	58
		Outer scales shortest, pappus capillary.	*Toraxicum.*	63
	Flowers white; pappus plumose.		*Leontodon.*	61
		Pappus single, brist.	*Hieracium.*	66
		Pap doub., outer scaly.	*Cynthia.*	59
Leaves cauline.	Achenia not rost.	Fls. yellow. Lvs. spinose-dent.; pap. very white.	*Sonchus.*	65
		Flowers blue. Pappus small, scaly.	*Cichorium.*	57
		Fls. whitish or cream col. Pap. copious, capillary.	*Nabalus.*	64
	Achenia with a filiform beak..	Involucre with calyculate scales.	*Lactuca.*	62
	Achenia rostrate	Involucre without calyculate scales.	*Tragopogon.*	60
		with a short, thick beak; involucre imbricate.	*Mulgedium.*	67

Suborder I. TUBULIFLORÆ.

Corolla of the perfect flowers tubular, regular, the limb 5-cleft, or lobed.

Tribe I. VERNONIACEÆ.

Heads discoid, homogamous. Branches of the style subulate, hispid throughout.

1. VERNO'NIA.

Flowers all tubular; involucre semicylindric, of ovate, imbricated scales; receptacle naked; pappus double, the exterior chaffy; the interior capillary.

Named for Mr Wm. Vernon, fellow of St. Peter's College, Cambridge, Eng., who travelled in N. America in search of plants. Perennial herbs or shrubs. Lvs. mostly alternate.

V. Noveboracen'sis.

Leaves numerous, lanceolate, serrulate, rough; *cyme* fastigiate; scales of involucre filiform at the ends. A tall, showy plant with numerous large, dark purple flowers, found in meadows and other moist situations. Stem branching at top, reddish, about 4 feet high. Leaves crowded, paler beneath, radical ones often lobed. Cymes terminal, flat-topped, compound. Scales and corollas deep purple, the former ending in long threadlike appendages. Sept.
New York Vernonia. Iron-weed.

β. prealta; stem and *leaves* beneath pubescent; *scales* of the involucre destitute of the filiform appendages. Rather taller than the preceding, habits similar.

Tribe II. EUPATORIACEÆ.

Heads discoid or radiate. Branches of the style much elongated, obtuse, minutely pubescent towards the summit outside. Anthers not cordate. Leaves mostly opposite.

Section I. Heads discoid, homogamous.

2. EUPATO'RIUM.

Flowers all tubular; involucre imbricate, oblong; style much exserted, deeply cleft; receptacle naked, flat; pappus simple, scabrous.

This genus, says Pliny, derived its name from Eupater, king of Pontus, who first used it in medicine. Perennial herbs with opposite or verticillate leaves. Heads corymbose. Fls. cyanic. Ach. 5-angled. Anth. included.

* Involucre 3—5-flowered.

1. E. SESSILIFO'LIUM.

Leaves opposite, sessile, distinct, amplexicaul, ovate-lanceolate, rounded at the base, very smooth, serrate; *stem* smooth. Plant 2—4 feet high, in rocky woods. Stem slender, erect, branching at top into a corymb with white flowers. Leaves large, tapering regularly from the somewhat truncate base to a long point, with small serratures, paler beneath. Flower stalks downy. Heads 5-flowered, with twice as many scales in two rows. Sept.
Sessile-leaved Eupatorium.

2. E. TEUCRIFOLIUM. *Willd.* E. pubescens. *Bw.*

Leaves opposite, sessile, distinct, ovate, rough, veiny, the lower ones doubly serrate, the upper ones subserrate or entire; *stem* paniculate, pubescent, with fastigiate, corymbose branches above. Plant hairy, 2—3 feet high, with a somewhat panicled corymb of white flowers. The upper leaves are often entire. Involucre 5-flowered, with twice as many scales in two rows. Scarcely distinct from E. sessiliflorum. Aug. *Hairy Eupatorium.*

3. E. HYSSIPIFO'LIUM.

Leaves opposite (the upper ones alternate), often verticillate, linear-lanceolate, triple-nerved, punctate, lower ones subserrate, upper ones entire. A more delicate species, smooth in all its parts, or minutely pubescent, in dry fields. Stem about 2 feet high, branching, with numerous narrow leaves, which are mostly opposite, and a spreading corymb at the summit. Heads 5-flowered. Outer scales shortest, the others shorter than the purplish flowers. Aug. Sept. *Narrow-leaved Eupatorium.*

4. E. ROTUNDIFO'LIUM.

Leaves opposite, sessile, distinct, roundish ovate, subcordate at base, 3-nerved, veiny, coarsely serrate; *inner scales* of the involucre acuminate, as long as the flowers. A slender species, with large leaves, found in dry fields. Heads fastigiate-corymbed, each with 5 purplish flowers. Aug. Sept.
Round-leaved Eupatorium.

* * Involucre more than 5-flowered.

5. E. PURPU'REUM. *L.* E. purpureum, verticillatum, maculatum, &c. of authors

Leaves verticillate, in 4s or 5s, ovate-lanceolate, acuminate, serrate, petiolate, veiny, minutely punctate, rugose and somewhat rough; *stem* fistulous This is a tall plant, conspicuous for its large, pale purple corymbs, about thickets and low grounds. Stem 5 or 6 feet high, hollow in various degrees, whence it is called *trumpet-weed.* It terminates above in a large fastigiate corymb. Each involucre consists of about 8—15 leaves, and contains about 8 flowers, with very long styles. Aug. Sept. *Purple Eupatorium.*

β. verticillatum, leaves verticillate, in 3s or 4s, acuminate at each end, unequally serrate, nearly smooth; *stem* nearly or quite solid, smooth. A tall plant with the general aspect of the preceding, found in wet woods. Stem slender, round, 4 feet high, with a large terminal corymb, and smaller axillary ones. Leaves in whorls of about 4, large, tapering from the middle to both ends. Scales whitish, corollas purple.

γ. ovatum, leaves rather ovate than lanceolate, and the stem rather taller.

δ. maculatum, leaves pubescent beneath; *stem* pubescent, furrowed, punctate with oblong purple spots. Tall like the foregoing, found in low grounds.

6. E. PERFOLIA'TUM.

Leaves connate-perfoliate, pubescent. A common well-known plant of low grounds, meadows, &c., always distinguished by the leaves being pierced by the stem. Stem 1—3 feet high, rough and hairy, round. Each pair of leaves are so united at the base as to constitute a single leaf perforated in the middle by the stem. They are placed at right angles to the stem, and, both combined, are often near a foot in length. From the stem, where they are broadest, they taper each way to a long point, are rough, rugose, serrate. Flowers in terminal corymbs. Involucre about 12-flowered. The whole plant is bitter and used in medicine as a tonic. Aug. *Thoroughwort. Boneset.*

7. E. AROMA'TICUM.

Leaves petiolate, opposite, subcordate, ovate, acute, 3-nerved, obtusely serrate, smooth; *stem* corymbose at the summit; involucre simple. In low woods. Whole plant slightly pubescent, about 2 feet high. Petioles short. Flowers large, white and aromatic, in small corymbs. Involucre scales about equal, 10—15-flowered. Aug. Sept. *Aromatic Eupatorium.*

8. E. PUBE'SCENS. *Muh.* E. ovatum. *Bw.*

Stem hirsute; *leaves* opposite, sessile, ovate, acute, obtusely dentate, rough, pubescent; *corymb* fastigiate; *involucre* about 8-flowered. A large rough plant, 3—4 feet high, growing in dry grounds. Distinguished by its opposite broadly-ovate leaves, and its strong pubescence. Involucre of about 12 pubescent scales, the outer much the shortest. Aug.

9. E. AGERITOI'DES.

Stem smooth; *leaves* on long petioles, subcordate, ovate, acuminate, dentate, 3-nerved, nearly smooth; *corymbs* compound. Rocky hills and woods. Stem round 2—3 feet high, and, with the whole plant, nearly smooth. Leaves opposite, broad at base, the lower ones on stalks 1 or 2 inches in length. Heads numerous, in small clusters, constituting a compound corymb. Involucre scales mostly in one row, containing 12 or more flowers of a pure white. Aug. Sept. *Nettle-leaved Eupatorium.*

3. MIKA'NIA.

Flowers all tubular; involucre 4—6-leaved, 4—6-flowered; receptacle naked, pappus axillary, simple, scabrous.

In honor of Prof. Mikan of Prague. Mostly climbing herbs with opposite leaves. Achenia angled. Stamens partly exserted.

M. SCANDENS.

Stem smooth; *leaves* cordate, repand-toothed, acuminate, the lobes divaricate, unequal; *flowers* corymbed. A climbing plant of wet thickets. Every part smooth. Leaves opposite on long stalks, very long-pointed.—Branches opposite, axillary, each with a small corymb of whitish or pink-colored flowers. Involucre 4—6-leaved, with as many flowers. Aug. Sept. *Climbing Boneset.*

4. LIA'TRIS.

Flowers all tubular, involucre oblong, imbricate; receptacle naked; pappus plumose, copious; achenia obconic, 10-striate; style much exserted.

Gr. λι, a syllable prefixed to strengthen the signification, and ατρως, invulnerable; one of the species is said to cure the bite of the rattle-snake. Perennial herbs (or shrubs). Stem simple. Root tuberous. Lvs. alternate. Fls. cyanic.

1. L. SCARIO'SA.

Stem hairy, erect; *leaves* lanceolate, pubescent with a scabrous margin; *heads* in long racemes or spikes; *scales* obovate, nearly smooth with a membranous, colored margin, the lower ones spreading. This handsome plant grows 4—5 feet high, in woods and sandy hills. Stem rather stout. Heads an inch in diameter. Corollas purple, numerous, alternate and distant, in a long, erect dense raceme. It is regarded as efficacious in curing the rattle-snake's bite, for which purpose the bruised root is applied to the wound, while a decoction of the same in milk is taken inwardly. Aug. *Gay Feather.*

2. L. SQUARRO'SA.

Stem simple, hairy; *leaves* numerous, long-linear, nerved; *margins* a little rough; *raceme* leafy, few-flowered; *scales* of involucre leafy above, rigid, lanceolate, spreading. In dry, sandy soils. Stem 2—3 feet high, thickly beset with long, linear leaves. An extremely beautiful plant with 5—20 large heads of brilliant purple flowers. It varies in degrees of pubescence, leafiness, flowering, &c. This, with many other species of this fine N. American genus, well deserves a place in the flower garden. Like the former species it is considered an antidote to the bite of a rattle-snake. Aug. *Blazing Star.*

3. L. SPICATA, another beautiful species with purple flowers is occasionally cultivated in gardens. Native of the Middle States.

5. AGERA'TUM.

Heads many-flowered, subglobose, discoid; involucre imbricated; style exserted; receptacle naked; pappus of 5 somewhat awned palæ.

Gr. α, privative, and γηρας, old age; because it never grows old, that is, always preserves its color. Tropical annual herbs. Lvs. opposite.

1. A. MEXICA'NUM.—Hispid; *leaves* cordate, ovate, crenate, rugose; *corymb* compound; chaff of the pappus lanceolate, awned. A Mexican plant with blue, imperishable flowers. *Mexican Ageratum.*

2. A. CONYZOI'DES.—Stem hairy, branching; *leaves* ovate, subserrate, on long stalks; chaff of the pappus awned, denticulate. Native of Georgia and all Tropical America. An ornamental species with light blue flowers. *Conyza-like Ageratum.*

6. STE'VIA.

Flowers all tubular; heads cylindric; scales in a single row; receptacle naked; pappus chaffy.

In honor of Peter James Esteve, a Spanish physician and botanist of the 16th century. Mexican, mostly perennial herbs. Lvs. alternate. Fls. cyanic.

1. S. SERRA'TA.—*Leaves* linear-lanceolate, serrate at the end; *corymbs* fastigiate; *pappus* chaffy and awned. Flowers flesh-colored. Plant 1—2 feet high. Cultivated. July—Sept. *Sweet-scented Stevia.*

2. S. HYSSOPIFO'LIA.—*Leaves* oblong-ovate, entire; *corymbs* spreading; pappus awned, as long as the corolla. Plant 1—2 feet high. Corollas pink-colored. A pretty garden flower. Aug. Sept. *Hyssop-leaved Stevia.*

S. purpurea has lanceolate leaves, purple flowers in a level topped corymb.

S. pedata, an annual species, with entire digitate-pedate leaves and white flowers.

Section II. Heads radiate.

7. TUSSI'LAGO.

Heads many-flowered, radiate; flowers of the margin pistillate, those of the disk staminate; involucre simple; receptacle naked; pappus capillary.

Lat. *tussis,* a cough, and *ago,* to manage; the flowers have been much employed for curing a cough. A perennial herb. Lvs. radical. Fls. yellow. Rays very narrow.

1. T. FA'RFARA.

Scape single-flowered, scaly; *leaves* cordate, angular, dentate, downy beneath. A low plant with large radical leaves, in wet places, brook-sides, and is a certain indication of a clayey soil. The flowers appear in March and April, long before a leaf is to be seen. They are yellow, with many rays, on leafless, simple, bracted stalks about 5 inches high. The leaves, which come forth after the flowers are withered, are broadly heart-shaped, about 5 inches broad and 7 long, dark green above, covered with a cottony down beneath, and on downy stalks. "The cotton of the leaves wrapped in a rag dipped in a solution of saltpetre and dried in the sun makes excellent tinder." The plant is sometimes used in medicine as an expectorant. *Colt's-foot.*

8. NARDO'SMIA.

Heads many-flowered, radiate, somewhat diœcious; flowers of the margin pistillate, disk perfect, but abortive in the sterile plants, involucre simple; receptacle flat, naked; pappus capillary.

Gr. ναρδος, spikenard, οσμη, smell; from the fragrance of the flowers.—Perennial herbs, with radical leaves. Fls. cyanic. The ray flowers of the sterile plants are in a single series, of the fertile, in several, but very narrow.

2. N. PALMA'TA. *Hook.* Tussilago palmata. *Ait.*

Scape with a fastigiate thyrse or corymb; *leaves* roundish cordate, 5—7-lobed, tomentose beneath, the lobes coarsely dentate. In swamps. A coarse, stemless plant with large deeply and palmately-lobed leaves and a stout scape covered with leaf-scales and 1—2 feet high. The heads are fragrant, numerous, with obscure rays, those of the heads of the barren plants almost inconspicuous. May. *Palmately-leaved Colt's-foot.*

TRIBE III. ASTEROIDEÆ.

Heads radiate, rarely discoid. Branches of the style more or less flattened and linear, equally pubescent above outside. Leaves mostly alternate.

Section I. Heads radiate. Rays cyanic.

9. ASTER,

Ray flowers pistillate, in 1 row, disk-flowers perfect, scales imbricated, often with green tips; receptacle flat, alveolate; pappus simple, capillary, scabrous; achenium usually compressed.

Gr. αστηρ, a star; from its radiated flowers. A large genus of perennial (one species annual) herbs with alternate leaves, very abundant in the United States, blossoming in late summer and autumn. Invol. oblong, imbricate, the inner scales loose, the outer spreading. Disk fls. tubular, regular, yellow, changing to purple; ray fls. generally few (6—100), oblong, ligulate, 3-toothed, finally revolute, blue, purple or white, never yellow.

§ Lower leaves cordate, petiolate. * Heads corymbose.

1. A. CORYMBO'SUS. *Ait.* Eurybia corymbosa. *Cass.*

Stem corymbose-fastigiate, smooth; *branches* hairy, leaves ovate, acutely serrate, acuminate, the lower ones cordate, petiolate; *petioles* naked; *involucre* oblong, imbricate with closely appressed, obtuse scales. Common in dry woods. Stem two feet high, smooth, often reddish, more or less flexuous. Leaves large, mostly smooth, lower ones cordate-acuminate, with sharp serratures, middle ones ovate, upper ones becoming lanceolate. Flowers in a broad, flat-topped corymb, large, very open, with about 6 long, narrow, white rays. Aug. *Corymbed Aster.*

2. A. MACROPHY'LLUS. *Willd.* Eurybia macropoylla. *Cass.*

Stem branched, diffuse; *leaves* ovate, petiolate, serrate, rough, upper ones ovate-cordate, sessile, lower ones cordate, petiolate; *petioles* somewhat winged; *involucre* cylindric, closely imbricate with oblong, acute scales. Distinguished for its very large root leaves which are 6—10 inches long and 3—5 wide. Grows in woods. Stem furrowed, 1—2 feet high. Leaves nearly smooth. Flowers rather large, white or pale blue. Sept. *Large-leaved Aster.*

§ Lower leaves cordate, petiolate. * * Heads paniculate.

3. A. CORDIFO'LIUS.

Stem paniculate, smoothish; *lower leaves* cordate, hairy beneath, sharply serrate, acuminate, petiolate; *petioles* winged; *involucre* closely imbricate, the scales with short, green tips. Common in rocky woods. Stem smooth below, more or less pubescent above, a little flexuous, striate, 2 feet high, with a handsome panicle of racemes at top of numerous, rather small flowers. Rays 10—15, pale blue varying to white. Lower leaves large, cordate, with a deep sinus at base, the serratures very acute, the summit ending in a long, acute point, slightly rough above, hairy and paler beneath. Petioles more or less winged, hairy. Above, the leaves are gradually reduced to small or minute bracts. Sept. *Heart-leaved Aster.*

4. A. SAGITTIFO'LIUS.

Stem with racemose branches above, smooth; *leaves* oblong-lanceolate, acuminate, sessile, serrate in the middle, radical ones ovate, oblong, cordate-sagittate, serrate, petiolate; *involucre scales* loose, lanceolate. Found in rocky woods. Stem 2—4 feet high, dividing into many ascending, rigid branches, with numerous and crowded heads, forming a compound panicle of racemes. Heads small, each with about 12 rays which are white or with various shades of blue. Leaves becoming smaller above, lanceolate and even linear. Sept. Oct. *Arrow-leaved Aster.*

5. A. UNDULA'TUS. *Ait.* A. diversifolius. *Muh.*

Stem paniculate, hispid; *branches* secund, leafy, 1-flowered; *leaves* oblong-cordate, amplexicaul, very entire, hairy, somewhat undulate or crenate-serrate, lower ones ovate, cordate, subserrate, with winged petioles. Native of dry woods. Plant rough, about 2 feet high, with slender branches. Lower leaves on long winged petioles, cordate-acuminate, upper ones becoming narrow-ovate and clasping. Flowers pale blue, solitary, forming a loose panicle of somewhat one-sided racemes. Aug. Sept. *Wavy Aster.*

§ § Leaves lanceolate and ovate, the lower conspicuously serrate.
* Heads corymbose.

6. A. RA'DULA.

Stem erect, simple below, angular; *leaves* lanceolate, acuminate, narrowed towards the base, sessile, serrate, rugose and rough; *involucre* imbricate with appressed scales spreading with green tips. Moist groves and hedges. Hight 1—3 feet. Distinguished for its stiff, narrow, sharply-serrate leaves which abundantly clothe the straight, smooth stem. Branches nearly naked, undivided, each having a single large head, rarely more. Rays numerous, short, white or purplish. The lower leaves are sometimes ovate-lanceolate. Aug. September. *Rasp-leaved Aster.*

7. A. SPECTA'BILIS.

Stem erect, *leaves* somewhat scabrous, oblong-lanceolate, sessile, entire, lower ones serrate in the middle; *branches* corymbose; *heads* hemispherical, with numerous, squarrose-spreading, ciliate scales. A low Aster of pine barrens, Ms. Stem straight, 1—2 feet high, branching above into a nearly simple corymb of 10—15 heads, which are large and showy, with many long, blue rays. Sept.—Nov. *Showy Aster.*

8. A. LONGIFO'LIUS. *Lam.* A. laevigatus. *P.*

Glabrous; *stem* very branching, branches many-flowered; *leaves* subamplexicaul, linear-lanceolate, lower ones serrate, smooth; *involucre scales* lax, lanceolate, nearly equalling the disk. Fields and thickets. Stem 3 feet high. Leaves pale below, shining above, smooth both sides, the lower ones 4—6 inches long. Heads numerous, showy, with 25—30 light blue rays. Nov.

9. A. ACUMINA'TUS.

Stem simple, flexuous, angular, branching into a corymbose panicle above; *leaves* broad-lanceolate, narrowed and entire at the base, serrate and acuminate; *involucre scales* lax, linear. Grows in mountains and woods. Stem a foot high, rough, downy. Leaves large, unequally and remotely serrate above, and ending in a long, acuminate point. Panicle corymbose, terminal, few-flowered, nearly or quite naked. The leaves are mostly situated just below the corymb. Heads rather large, with about 15 long, white rays. Aug. *Acuminate Aster.*

10. A. CHINE'NSIS.—*Leaves* ovate, coarsely dentate, petiolate, cauline ones sessile, cuneate at base; *stem* hispid; *branches* with single flowers. The common China Aster is said to be originally from China. Stem about 18 inches high, with long branches, each terminated by a single flower. The flower is the largest of any of the Asters, having been much improved by cultivation. Disk yellow. Rays dark purple. There are varieties with white, blue and red flowers of various shades, also of double and semi-double. Another has very short rays of various colors. July—Sept. *China Aster.*

§ § Leaves lanceolate and ovate, the lower conspicuously serrate.
* * Heads paniculate.

11. A. TRADESCA'NTI.

Branches virgate, paniculate; *leaves* lanceolate, remotely serrate, sessile, smooth; *involucre* closely imbricate; *stem* round, slender, smooth. A fine species, with numerous leaves, growing in fields. Stem rigid, brownish, about 3 feet high, with numerous slender, racemose branches. Lower stem-leaves narrowly lanceolate, 4 inches long, gradually reduced in size upwards. Heads small, numerous, with pale-purple rays. Aug.--Oct.
Tradescant's Aster.

12. A. MISER. *T. & G.* (A. miser, divergens, diffusus and pendulus. *Ait.*)

Stem racemose-paniculate, hairy or pubescent; *leaves* sessile, lanceolate, sharply serrate in the middle; *involucre* imbricated with acute scales; *rays* short. A very variable species common in old fields, hedges, &c. In hight it varies from 6 to 30 inches, and in luxuriance proportionately to the moisture or fertility of the soil. The stem is very branching or nearly simple, bearing a large, compound, racemose panicle or a few simple racemes. Leaves varying from narrow-lanceolate to broad-oval, 1—5 inches in length. Heads usually numerous, small, with small white or purple rays. *Starved Aster.*

β. *diffusus; branches* spreading, diffuse; *leaves* elliptic-lanceolate, more or less narrowly so; *heads* often sessile, forming short, crowded spikes, or long virgate ones. Stem hairy, as well as the mid-rib of the leaves beneath.

13. A. SIMPLEX. *Willd.*

Stem racemose-paniculate above, smooth; *leaves* linear lanceolate, entire, smooth, the lower ones serrate towards the end; *involucre* loose, imbricate, the scales acute, spreading at their points. Another variable species, found in low grounds. Stem 2--5 feet high. Leaves 2--4 inches long, sessile, rough-margined, narrow-acute. Flowers on long stalks, middle size. Sept.
Willow-leaved Aster.

β. (*T. & G.*) *branches* hirsute or pubescent; *heads* above the middle size, with blue rays. Stem 4—6 feet high.

γ. (*T. & G.*), *branches* pubescent, with short, crowded spikes of small heads; *rays* pale blue.

14. A. TENUIFO'LIUS.

Stem smooth, erect, paniculate-branching, with 1-flowered branchlets; *leaves* linear-lanceolate, tapering at each end, long-acuminate, entire, with roughish margins, the lower ones often serrate in the middle; *involucre scales* lax, acute. Grows in moist fields. Stem 2--4 inches long, those of the branches and branchlets proportionately smaller. Heads small with numerous (20--30), long, pale-purple rays. Sept. *Narrow-leaved Aster.*

15. A. PUNI'CEUS.

Stem hispid, paniculate; *leaves* amplexicaul and more or less auriculate at base, lanceolate, serrate, roughish above; *involucre* loose, longer than the disk, the scales linear-lanceolate, long and revolute, nearly equal, and 2-rowed. A large handsome Aster common in swamps and ditches, sometimes in dry soils. Stem 4--6 feet high, generally red, (at least on the south side), furrowed, hispid. Lower leaves with remote serratures, rough-edged and rough on the upper surface, all accuminate and narrowed at base. Flowers large and showy. Rays 50—80, long and narrow, pale purple. Aug—Oct.
Red-stalked Aster.

16. A. PRENANTHOI'DES. *Muh.*

Stem hairy or pubescent above, corymbose-paniculate; *leaves* oval-lanceolate, serrate, acuminate, attenuate at base into a long winged petiole which is auriculate at the insertion; *involucre* imbricated with several rows of linear, green-tipped, spreading scales. Grows in low woods, N. Y. Stem 2--3 feet high with a terminal corymbose panicle of large heads on short peduncles. Rays showy, pale blue. Leaves remarkable for the long, winged petiole, which is dilated at its base into rounded, auriculate segments. Branch-leaves smaller, nearly entire. Sept.—Nov.

§ § § Leaves entire (the lowest rarely subserrate). * Heads corymbose.

17. A. ELO'DES. *T. & G.*

Glabrous and very smooth; *branches* corymbose-paniculate; *leaves* linear-lanceolate, entire, shining, thick, upper ones somewhat clasping; *involucre* closely imbricated in several rows of linear, green-pointed, spreading scales. In Swamps. Stem 1—2 feet high, with very smooth foliage and large, showy, blue flowers. Aug. Sept. *Swamp Aster.*

18. A. NOVÆ A'NGLIÆ. *L.*

Flowers terminal, crowded, somewhat fastigiate; *stem* hispid, paniculate; *leaves* linear-lanceolate, amplexicaul, auriculate at base; scales of involucre equal, lax, linear-lanceolate, rather longer than the disk. A large and beautiful Aster, in fields, meadows, and shades. In Europe it is deemed worthy of cultivation. Stem 4—6 feet high, straight, erect, viscidly hairy, colored. Leaves very numerous, narrow, entire, with 2 auricular appendages at base. Flowers large, in a kind of loose paniculate corymb. Ray-flowers deep purple, numerous (75—100). Sept. *New England Aster.*

19. A. NEMORA'LIS. *Ait.* A. lædifolius. *P.*

Branches corymbed; *peduncles* 1-flowered, nearly naked, filiform; *involucre* loosely imbricate, half as long as the disk, with very acute scales; *ray-flowers* about 20. Leaves linear-lanceolate, tapering to the base, nerveless, revolute-margined, roughish. Plant about a foot high, found in woods, common. It varies in the number of heads, there being sometimes but *one*. The leaves have sometimes a few slight indentures. Rays large, white or pale-purple. Sept. Oct. *Wood Aster.*

20. A. PTARMICOI'DES. *T. & G.*

Stem corymbose-fastigiate above; *leaves* linear-lanceolate, acute, rough-margined, entire, lower ones dentate, attenuated into a short petiole; *rays* short. A very distinct Aster, low and leafy, found in rocky soils, by streams, &c., rare. Stems clustered, simple, each bearing a spreading panicle of heads which are below the middle size and furnished with snow-white rays. July —Sept. *Sneezewort Aster.*

21. A. FLEXUO'SUS. *Nutt.* A. sparsiflorus. *P.*

Stem branching, slender, flexuous, very smooth; *leaves* long and succulent, the lower ones sublanceolate-linear, upper ones subulate; *branches* leafy, 1-flowered; *involucre scales* lanceolate, acuminate, appressed; *rays* numerous, shorter than the involucre. Grows in salt marshes. The whole plant very smooth, a foot high, with large, purple flowers; disk yellow. Aug.—Oct. *Few-flowered Aster.*

§ § § Leaves entire (the lowest rarely subserrate), † cauline ones amplexicaul.
* * Heads paniculate.

22. A. PHILOGIFO'LIUS. *Muh.* A. amplexicaulis. *Willd.*

Stem simple, paniculate above, pubescent; *leaves* lanceolate, cordate, clasping the stem, acuminate, scabrous on the margin, pubescent; *panicle* loose, few-flowered; *scales* imbricate, lanceolate, lax, the points herbaceous. A fine species with large violet-colored flowers. Grows in moist grounds, N. Y. Stem 2—3 feet high, slender, branching above into a loose, terminal panicle. Heads solitary, on the ends of the leafy branchlets. Rays 20—30. Scales rather numerous. Leaves large (3--4 inches long) on the stem, becoming small and bracteate on the branches. Aug.--Nov. *Flame-colored Aster.*

β. patens (A. patens, *Ait.*); *leaves* auriculate-cordate, amplexicaul at base.

23. A. LÆVIS. *L.* A. mutabilis. *L.* A. amplexicaulis. *Muh.*

Very smooth; *stem* angular; *branches* simple, 1-flowered; *leaves* subamplexicaul, remote, oblong, entire, shining, radical ones subserrate; *involucre* closely imbricate, the scales broadly linear, rigid, thickened and herbaceous at the apex. A very smooth and beautiful species, 2--3 feet high, growing in low grounds. Stem polished, green, often somewhat glaucous. Leaves rather fleshy, broadest at base, the lower ones tapering to a winged petiole. Flowers large and showy, with numerous rays of a fine blue, becoming purple. Sept.--Nov. *Smooth Aster.*

β. cyaneus (*T. & G.* A. cyaneus. *P.*); *stem* and *leaves* conspicuously glaucous. This variety is perhaps the most beautiful of all the Asters.

γ. levigatus (*T. & G.* A. levigatus. *Willd*); *leaves* long, linear-lanceolate.

These beautiful varieties, heretofore exalted by most writers into species, are here exhibited in accordance with the views of Drs. Torrey and Gray, and undoubtedly in their true relationship.

24. A. CA'RNEUS.

Smooth; *leaves* uniform, narrow-lanceolate, entire, sessile, the lower ones tapering to the base, upper, stem-clasping; *stem* dividing into straight, racemose, leafy, branches bearing middle sized heads with pale-purple rays. Sept. Oct. *Flesh-colored Aster.*

25. A. LAXUS.

Stem loosely corymbose-panicled above; *leaves* linear-lanceolate, acuminate, rough-edged, lower ones subserrate, those of the stem subreflexed, of the branches much spreading; *involucre* imbricate, scales lanceolate, acute, reflexed at the apex. Fields. Stem 2--3 feet high with small, bluish flowers. Sept. Oct. *Loose-stalked Aster.*

26. A. PRÆA'LTUS. *Poir.* A. salicifolius. *Ait.*

Stem corymbosely-paniculate, with hairy lines above; *leaves* lanceolate, closely sessile or subamplexicaul, smooth and shining above, with a rough margin, subserrate or entire, acute, the lower ones narrowed towards the base; *involucre* loosely imbricated with acute, green-tipped linear scales. Common in moist woods and by streams, varying from 2 to 3 feet in hight. The stem is slender, often flexuous, green or often purple, dividing above into flowering branches, arranged in a sort of corymbose panicle of large and showy blue flowers. Aug. Oct.

27. A. AMETHYSTI'NUS. *Nutt.*

Hirsute; *stem* racemose-paniculate; *leaves* linear-lanceolate, entire, rough, acute, with somewhat auriculate appendages at the clasping base; *involucre* of equal scales. Heads small, with azure rays. Aug.—Oct.

§ § § Leaves entire (the lowest rarely subserrate), † † cauline ones mostly linear and sessile. ** Heads paniculate.

28. A. ERICOI'DES.

Nearly or quite smooth; *branches* virgate, spreading, paniculate; *leaves* linear or linear-lanceolate, very smooth, those of the branches subulate and approximate, short, of the stem long, of the root oblong, spathulate; *involucre* somewhat squarrose. Grows in rocky fields. Stem 1—3 feet high, with numerous brittle branches and branchlets forming a thick bush and terminated each by a single pale-purple flower. Leaves rather numerous, the cauline ones 3 inches in length. Heads small, about 20-rayed. Sept. *Heath-like Aster.*

29. A. MULTIFLO'RUS.

Hairy or pubescent; *stem* diffusely branched; *leaves* linear, entire, sessile, pubescent, margins subciliate; *involucre* imbricate, squarrose, linear or spathulate, with oblong, ciliate scales. A very branching, diffuse species with very numerous, small flowers crowded on the racemose branches, each with about 12 white rays. Stem variously pubescent, 1—2 feet high. Leaves 1—2 inches long, obtuse, very narrow. Rocks and dry fields. Variable. Sept. *Many-flowered Aster.*

30. A. DUMO'SUS.

Nearly smooth; *branches* racemose-panicled; *leaves* numerous, smooth, linear, sessile, entire or subserrate, those of the branches very short; *involucre* cylindrical, closely imbricate. About 2 feet high, in dry shades and borders of woods. Stem much branched, smooth or slightly pubescent, with long, linear leaves, those of the branches smaller and becoming very minute.—Heads middle sized, scattered, solitary, with about 24 purplish white rays. Variable. Sept. *Bushy Aster.*

β. foliosus; leaves linear-lanceolate, tapering at each end, acute; *branches* few-flowered, somewhat racemed; *involucre* with linear, acute, appressed scales.

31. A. LINIFO'LIUS. *L.* A. subulatus. *Mx.*

Stem paniculate, much branched from the base; *leaves* long, linear, very acute, the uppermost subulate; *involucre* cylindric with subulate scales; *radical heads* minute. An annual species, found in salt marshes. Stem 12—18 inches high, very smooth, thick, reddish. Leaves smooth, sessile. The plant is very branching, with numerous short-rayed, small, purple flowers. Aug. —Nov. *Sea Aster.*

10. SERIOCA'RPUS.

Heads few-flowered; ray flowers 4—6, pistillate; disk fls. 6—10, perfect; involucre oblong, imbricated; scales appressed, with green, spreading tips; receptacle alveolate; achenium obconic, very silky; pappus simple.

Gr. σηρικος, silken, καρπος, fruit; on account of the densely silken achenia. Perennial herbs, with alternate leaves and close corymbs. Rays white.

1. S. SOLIDAGI'NEUS. *Nees.* Aster solidaginoides. *Mx.*

Smooth; *corymb* fastigiate; *heads* aggregate, sessile, few-flowered, 5-rayed; *scales* obtuse, whitish, with green tips; *leaves* linear-lanceolate, obtuse, entire,

obsoletely 3-nerved, rough on the margin. About 2 feet high, with pale green foliage and a terminal, level-topped corymb of small white flowers. Grows in woods. Stem slender, smooth, simple. Leaves smooth. Involucre imbricate, oblong, with appressed scales. Rays long, white. Jl. Aug.

2. S. CONYZOI'DES. *Nees.* Conyza asteroides. *L.* Aster conyzcides. *Willd.*

Stem somewhat pubescent, simple, corymbose at top; *leaves* oval-lanceolate, smooth beneath, slightly 3-nerved, narrowed at base, acute, the upper ones sessile, nearly entire, the lower narrowed into the petiole, serrate; *involucre* cylindrical, the scales oval, obtuse, appressed, slightly reflexed at summit; *rays* 5, short. Grows in woods and thickets. Stems somewhat 5-angled, 1—2 feet high. Leaves somewhat fleshy. Ray short, but longer than the disk, white. July. August.

11. DIPLOPA'PPUS.

Heads many-flowered; ray fls. about 12, pistillate; disk fls. perfect; involucre imbricate; receptacle flat, subalveolate; pappus double, the exterior very short, interior copious, capillary; achenium compressed.

Gr. διπλοος, double, παππος, pappus. Perennial herbs, with alternate and entire leaves. Rays cyanic; disk yellow. Inner pappus about as long as the tube of the corolla.

1. D. LINARIFO'LIUS. *Hook.* Aster linarifolius. *L.*

Stem straight, roughish; *branches* 1-flowered, fastigiate; scales of *involucre* imbricate, carinate, as long as the disk; *leaves* linear, entire, 1-nerved, mucronate, carinate, rough, rigid, those of the branches recurved. A rough, rigid, leafy species, growing in dry pastures, woods, West River Mt., &c. Stems subsimple, purplish, about a foot high, decumbent at base. Leaves numerous, rigidly upright or deflected, obtuse, with a small, mucronate point, pale beneath, shining above. Branchlets near the top, leafy, each with one rather large and showy, violet-colored flower. Aug. Sept.

Linear-leaved Diplopappus.

2. D. UMBELLA'TUS. *T. & G.* Aster umbellatus. *Ait.*

Stem smooth, straight, simple; *corymb* fastigiate; *leaves* long, lanceolate, smooth, attenuate-acuminate at each end, rough on the margin; *involucre scales* obtusely lanceolate. A tall, handsome plant, growing in low grounds, river banks and fields. Stem 3—4 feet high (in dry fields but 1—2), purplish, channelled, simple, smooth, branching above into a large, level-topped, compound corymb of showy flowers. Leaves narrow, entire, 4—6 inches in length, those of the branchlets smaller. Rays about 12, white. Disk yellow. Aug. September.

Umbellate Diplopappus.

3. D. CORNIFO'LIUS. *Darlington.* Aster cornifolius. *L.*

Stem smooth below, scabrous and slightly paniculate above, few-flowered; *leaves* elliptical, acuminate, entire, tapering to the base, with scattered hairs, rough-edged; *involucre scales* imbricate, shorter than the disk. Grows in woods, common. The whole plant nearly smooth, erect, 1—2 feet high. Leaves acute at the base, paler beneath, on very short stalks. Flowers few, large; outer scales very short. Rays about 10, white. Jl. Aug.

12. ERI'GERON.

Heads many-flowered, subhemispherical; ray-flowers very numerous (40—150), narrow, linear and pistillate; flowers of the disk perfect; receptacle flat, naked; involucre nearly in 1 row; pappus generally simple.

Gr. ηρ, the spring, γερων, an old man; because it becomes old early in the season. Herbs, with alternate leaves. Rays cyanic. Pappus double in a few species, the outer one very short, the inner one longer than the corolla. Achenia compressed.

1. E. BELLIDIFO'LIUM. *Willd.* E. pulchellum. *Mx.*

Hairy; *radical leaves* ovate, subserrate; *stem leaves* remote, entire, lanceolate, amplexicaul; *stem* 3—5-flowered; *rays* nearly twice as long as the hemispherical calyx. An inhabitant of dry fields. Stem about 18 inches high, erect, simple. Leaves mostly radical, broader and rounded at the end with a few teeth, long, tapering at the base. Stem leaves rather acute, rounded and clasping at the base. Flowers few, at the top of the stem, on short stalks. Rays numerous, linear, pale purple. May, Jn. Per. *Robin's Plaintain.*

2. E. PHILADE'LPHICUM.

Pubescent; *leaves* subserrate, oblong-cuneate, those of the stem half-clasping; *rays* capillary, the length of the disk; *stem* branched above, many-flowered. A tall, branching species, pretty common in fields and pastures. Stem 3 feet high, slender. Leaves clasping, the lower ones sessile and remotely toothed. Flowers numerous, in a large, branching panicle. Rays very numerous and narrow, pale purple. Jn. Per. *Philadelphia Fleabane.*

β. (*T. &. G.*); *stem* stout; *cauline leaves* larger, mostly coarsely and sharply serrate; *corymbs* compound; *rays* pale purple or nearly white. Common in grass lands.

3. E. A'NNUUM. *Pers.*

Stem hispid with scattered hairs, branching; *leaves* hirsute, coarsely serrate, the lowest ovate, contracted at base into a winged petiole, stem leaves ovate-lanceolate, sessile, acute, the highest lanceolate; *rays* very numerous and narrow. Stem thick, 2—4 feet high, striate, terminating in a large, diffuse, corymbose panicle of large heads. Rays white or purplish, 100 or more, short. June—August. *Annual Fleabane.*

4. E. STRIG'OSUM.

Hairy and strigose; *leaves* lanceolate, tapering to each end, entire or with a few large teeth in the middle, lower ones 3-nerved and petiolate; *panicle* corymbose. A rough weed infesting grassy fields, much to the annoyance of the cultivators. Stem about 2 feet high, slender, furrowed with scattered bristles and bearing a large, loose corymb. Leaves also with scattered bristles, sessile. Rays very narrow, white. Jn.—Oct. Bienn. *Fleabane White-weed.*

β. (E. integerifolium. Bw.); *stem* simple, smooth; *leaves* entire, 3-nerved; *flowers* corymbed. Plant 2 feet high, in fields and hedges. Leaves pubescent, the lower ones rarely subdentate. Rays white, 100—150.

5. E. CANADEN'SE.

Involucre oblong; *rays* numerous, (40—50), crowded, minute; *pappus* simple; *stem* hairy, paniculate; *leaves* lanceolate, lower ones subserrate. A very common annual plant of no beauty, growing by road sides and in fields. Stem 6—48 inches high, branching, hairy and furrowed. Leaves very narrow, with

rough edges. Flowers white, very numerous, small, of mean appearance, irregularly racemose upon the branches, and constituting a large, oblong panicle. The plant varies greatly in size according to the soil. Aug—Nov.
Common Fleabane.

13. BELLIS.

Heads many-flowered; rays pistillate; disk perfect; involucre hemispherical, of equal scales; receptacle subalveolate, conical; pappus 0.

Lat. *bellus*, pretty; a term which well characterizes the *Daisy*.

B. PERE'NNIS.—*Scape* naked, single-flowered; *leaves* obovate, crenate. Native of England and other parts of Europe, naturalized in some parts of N. England in cultivated ground. Scape 3 or 4 inches high, with a single white flower which is single, double or quilled in the different varieties. Blossoms in the spring and summer months. Per. *Garden Daisy.*

14. DA'HLIA.

Involucre double, the outer series many-leaved, the inner 1-leaved, 8-parted; receptacle chaffy; pappus 0.

Named for Andrew Dahl, a Swedish botanist, pupil of Linnæus. Splendid perennial. Mexican herbs. Leaves pinnate, opposite.

1. D. SUPE'RFLUA.—*Rachis* of the *leaves* winged; *leaflets* ovate, acuminate, serrate, shining and smooth beneath; *outer involucre* reflexed. This superb and fashionable genus is a native of sandy meadows in Mexico.
Barren-rayed Dahlia.

2. D. FRUSTRA'NEA.—*Rachis* of the *leaves* naked; *leaflets* ovate-acuminate, serrate, roughish beneath; *outer involucre* spreading. The Dahlia has coarse and rough leaves resembling those of the common elder, but the flowers are large and beautiful, sporting into numerous varieties of single and double-flowers, of every possible shade of scarlet, crimson, purple, red and yellow. They grow in any soil or situation, and the poorer the soil the smaller the plant, but the earlier and more abundant the flowers. If raised from seeds the plants will blossom the second year, or the first, if sown in February and forced by artificial heat. They are more generally propagated by the divisions of the roots. As soon as the frost blackens the tops, the roots require to be taken up and kept in a dry place, secure from frost until spring. They are the better secured by being buried in dry sand. *Fertile-rayed Dahlia.*

Section II. Heads radiate. Rays yellow.

15. SOLIDA'GO.

Flowers of the ray about 5, remote, of the disk perfect; involucre oblong, imbricate, with appressed scales; receptacle punctate, narrow; pappus simple, capillary, scabrous.

Lat. *solidari*, to unite; from the vulnerary qualities of the plants. A large genus of perennial herbs Stems erect, branching near the top. Lvs. alternate. Heads small, with from 1 to 15 small rays (very rarely 0). Fls. yellow (one species S. bicolor, has whitish rays). The species are exceedingly abundant in the United States, and, with the Aster, are every where seen in blossom in the autumnal months.

§ Heads corymbose. * Leaves all linear, entire, sessile.

1. S. LANCEOLA'TA.

Stem angular, hairy, much branched; *leaves* linear-lanceolate, entire, 3-nerved, rough-margined, slightly hispid on the nerves beneath; *corymbs* terminal, fastigiate. In woods and meadows. Distinguished from most other species by its flat-topped corymb. Stem 2—4 feet high, with numerous, very long and narrow leaves, which are distinctly 3-nerved and acutely pointed. Flowers in terminal, crowded clusters. Involucre ovate. The whole plant is fragrant. Sept. *Grass-leaved Goldenrod.*

2. S. TENUIFO'LIA.

Stem angular, smooth, with many fastigiate branches; *leaves* linear, spreading, obscurely 3-nerved, scabrous on the margin, the axils leafy; *corymb* terminal, consisting of clustered heads; *rays* about 10, scarcely as long as the disk. Grows in sandy fields near the seacoast. A very slender species, distinguished from S. lanceolata by the extreme narrowness of the leaves and the thinner, more open corymb, which is often reduced to a few heads. The leaves bear tufts of smaller ones in their axils, and are punctate with resinous dots. August—October.

§ Heads corymbose. * * Lower leaves serrate, petiolate.

3. S. RI'GIDA.

Stem stout, rough and hairy; *leaves* ovate-oblong, rough with minute hairs, those of the upper part of the stem very entire, lower ones serrate; *flowering branches* paniculate, with close, short racemes; *rays* elongated; *involucre scales* obtuse. A tall species, in rocky woods. Stem 3—5 feet high, round, striate, with rigid leaves, of which the radical ones are sometimes near a foot long. Flowers in a sort of corymbose panicle, very large, with large, deep yellow rays. Aug. Sept. *Hand-leaf Goldenrod.*

4. S. OHIOE'NSIS. *Riddel.*

Stem simple, very smooth; *lower leaves* on long petioles, lanceolate-oblong, obtuse, acute at base, serrate towards the summit; *upper leaves* lanceolate, subclasping, acute; *heads* small, in a fastigiate corymb. A very smooth species, in moist places. Western N. Y., Ohio, &c. Hight 2—3 feet. Sept. Oct.

§ § Heads in glomerate, axillary clusters.

5. S. SQUARRO'SA.

Stem stout, simple, erect, thickly pubescent above; *leaves* smooth, lower ones very broad, oval-spathulate, serrate, acute, upper ones lanceolate-elliptic, highest, entire; *racemes* glomerate, rigid and pubescent; *involucre* squarrose, many-flowered; *rays* 10—12, elongated. A handsome species, found on rocky hills. Stem 3—5 feet high. Flowers very large, forming a long terminal spike of short, dense, axillary fascicles or racemes. Sept. *Ragged Goldenrod.*

6. S. CÆ'SIA.

Stem erect, round, smooth and glaucous, often flexuous; *leaves* smooth, lanceolate, lower ones serrate; *racemes* axillary, erect. A very elegant species, in thickets and dry woods. Stem 1—3 feet high, of a bluish purple color, terete and slender, somewhat flexuous, simple or branched. Leaves 2—5 inches long, ending in a long point, sessile, glaucous beneath. Racemes axillary, numerous, short. Flowers of a deep, rich yellow. Rays 5—7, once and a half the length of the involucre. Aug. *Blue-stemmed Goldenrod.*

β. *hispida* has a hispid stem and rough leaves.

γ. *flexicaulis* (S. flexicaulis. P.); *stem* flexuous, angular; *leaves* ovate-lanceolate; *racemes* axillary. Leaves hardly 2 inches long, and half an inch wide. Racemes much shorter than the leaves, the upper ones nearly capitate. Rays pale-yellow.

7. S. LATIFO'LIA. S. macrophylla. *Bw.* S. flexicaulis, β. latifolia. *P.*

Stem somewhat flexuous, angular, smooth; *leaves* broad-ovate, acuminate at each end, deeply serrate, smooth; *petioles* margined; *racemes* axillary. A very distinct species, although considered by Pursh a variety of the last. Common in dry woods and by rocky streams. Stem slender, not always perfectly smooth, 2 feet high. Leaves very large, 3—5 inches long and 2—4 broad, contracted at the base into a winged stalk, long pointed, with remarkably long and acute serratures. Clusters axillary, very short, the stem ending with a longer terminal one. Flowers few. Sept.

8. S. BI'COLOR.

Hairy; *stem* simple; *leaves* elliptical entire, acute at each end, lower ones serrate, short-stalked; racemes short, dense, leafy, erect; *involucre scales* obtuse. In woods and dry hills. A species remarkably distinguished among the solidagos by having white rays. Stem generally simple, 2 feet high, a little hairy. Leaves hairy on both sides, mostly entire, gradually reduced in size upwards. Flowers in numerous close, short, axillary clusters, forming a long terminal, interrupted spike. Rays about 8, very short, yellowish-white, obscure. July. Aug. *Two-colored Goldenrod.*

§ § § Heads in erect, terminal, simple or compound racemes, not secund.

9. S. PUBE'RULA. *Nutt.*

Plant puberulent; *stem* simple, terete; *leaves* lanceolate, entire, attenuated at each end, radical ones subserrate; *racemes* spicate, axillary, erect and condensed; peduncles pubescent; *involucre scales* linear-lanceolate, acute; *rays* about 10, elongated. Found in low woods, Maine, Ms. Stem straight, purplish, 2—3 feet high, terminating in a long, thyrsoid spike of dense, appressed racemes. Leaves very minutely pubescent both sides, the lowest on dense, winged stalks. Heads rather large, bright yellow. Aug. Oct.

10. S. STRICTA.

Smooth; *stem* strict, erect, simple; *cauline leaves* lanceolate, very entire, rough-edged; *radical ones* serrate, very long; *racemes* paniculate, erect; *peduncles* smooth. In wet woods. Stem (and every other part) very smooth, about 2 feet high, ending in a long, close panicle composed of the appressed, dense, short racemes. Aug. *Willow-leaf Goldenrod.*

11. S. SPECIO'SA. *Nutt.*

Stem smooth, simple; *leaves* lanceolate, entire and scabrous on the margin, thick, the radical and lower ones subserrate, very broad; *racemes* erect, numerous, forming a terminal, thyrsoid panicle; *pedicels* shorter than the involucre, pubescent; *rays* large, few. Woods. A very tall, showy species, sometimes 6 feet high. Stem stout, often purple, furrowed. Leaves ample, some of them 6 inches long and half as wide. Heads exceedingly numerous, with conspicuous rays of a rich yellow, in a large, showy, pyramidal panicle.

12. S. THYRSOI'DEA. *Meyer.* S. virgaurea. *Bw*

Stem simple, flexuous, very smooth, pubescent above; *leaves* smooth, ovate, sharply serrate, acute, the lower ones on long petioles, the upper ones sub-

sessile, lanceolate; *racemes* mostly simple, short; *heads* large, with conspicuous rays. A very fine goldenrod abounding in woods on the sides of the White Mts., and at Franconia Notch. It is remarkable for the long, slender stalks of the lower, ovate leaves, and for the large, deep yellow flowers which exceed in size those of all other species. Stem 1—3 feet high, racemes axillary and terminal, usually in a thyrse-like panicle. Aug.

13. S. VIRGAU'REA.

Stem flexuous, furrowed, pubescent at top; *stem leaves* lanceolate, serrate; *lower ones* oval, attenuated at both ends; *racemes* erect, ray elongated, flowers large. This is the only species common to the two continents. One of its numerous varieties is seen scattered here and there on the lower summits of the White Mts., scarcely on Mt. Washington peak. The flowers are very few, often one only, but larger than those of most other species, and of a rich, golden yellow. Stem often purple, 2—3 inches high, simple, with axillary and terminal flowers. Aug. *European Goldenrod.*

§ § § § Heads in secund racemes. * Leaves evidently tripli-nerved.

14. S. NEMORA'LIS.

Stem subtomentose; *cauline leaves* oblanceolate, sessile, hispid, nearly entire, commonly with tufts, of smaller ones in their axils; *radical ones* subcuneiform, serrate; *racemes* paniculate, secund; *rays* 5—7. A common, starved-looking species with a greyish, dusty aspect, bearing a dense panicle of deep yellow flowers. Hight 1—2 feet. In dry, sterile fields and by roadsides. Heads small, but with conspicuous rays. Panicle composed of many short racemes, inclining to one side, or often of a single terminal, recurved one. Often the stem divides into branches, each bearing a panicle. Sept.

15. S. CANADE'NSIS.

Stem downy; *leaves* lanceolate, serrate, 3-nerved, rough; *racemes* paniculate, secund, recurved; *rays* short. In old fields, hedges, &c., common. From 18 inches to 5 feet high. Stem furrowed, terminated by a copious panicle which inclines to one side. Leaves sessile, 3 inches long, sometimes nearly entire, and perhaps a little downy. Heads almost innumerable, very small, with very obscure, yellow rays. Aug.—Oct. *Canadian Goldenrod.*

β. procera (*T. & G.* S. procera. *Ait.*); *stem* villous; *leaves* rough, villous beneath; *heads* larger and with larger rays. In low grounds, 4—7 feet high. Leaves distinctly 3-nerved.

16. S. SEROTI'NA.

Stem erect, round, smooth; *leaves* lanceolate, acuminate, serrate; *racemes* paniculate, secund; *peduncles* pubescent. A stout species found in meadows and thickets. Stem 4—7 feet high, very smooth and often glaucous. Leaves long, narrow, pointed, acute, 3-nerved, smooth, ciliate when young Heads small, with short rays, in an ample panicle. Sept. *Smooth Goldenrod.*

17. S. GIGA'NTEA.

Stem erect, smooth; *leaves* lanceolate, serrate, rough on the margin, obscurely 3-nerved; *racemes* paniculate, secund; *peduncles* hairy; *rays* short. In low, open grounds. A large and very smooth species. Stem purplish, 4—7 feet high. Heads rather large. Aug.—Oct. *Giant Goldenrod.*

18. S. REFLE'XA.

Leaves lanceolate, 3-nerved, subserrate, rough, reflexed; *racemes* panicled, subsecund. Common in old pastures. Stem 2 feet high, furrowed, scarcely

pubescent. Leaves small, rigid, nearly entire, curved backwards. Flowers in long racemes constituting a diffuse panicle. *Hanging-leaved Goldenrod.*

§ § § § Heads in secund racemes. ** Leaves veiny, † all entire.

19. S. SEMPERVI'RENS.

Stem erect, smooth; *leaves* lanceolate, somewhat succulent, smooth, entire, rough-edged, closely sessile; *racemes* paniculate; *peduncles* pubescent. In swamps and on river banks. Stem 3—5 feet high, purplish, somewhat glaucous, with numerous long and narrow leaves. Heads large. Rays about 8, long and narrow. Sept. *Evergreen Goldenrod.*

20. S. ODO'RA.

Stem pubescent, slender; *leaves* linear-lanceolate, very entire, smooth, punctate with pellucid dots, rough-margined; *racemes* paniculate, secund. In dry, fertile woodlands and sunny hills. The only species of Solidago which has properties generally considered either agreeable or useful. The leaves have a pleasant aromatic taste and smell, and yield by distillation a fragrant volatile oil, which resides in the pellucid reservoirs with which they are filled. When properly dried they are also said to be a good substitute for tea. Stem 2—3 feet high, slender, furrowed and pubescent above. Panicle usually one-sided. Racemes 2—3 inches long, spreading horizontally, each generally with a leaf at base and a single row of flowers on the upper side. July—Sept. *Sweet-scented Goldenrod.*

§ § § § Heads in secund racemes. ** Leaves veiny, † † lower ones serrate.

21. S. PA'TULA. *Muh.*

Stem erect, smooth, striate; *leaves* elliptical, serrate, rough on the upper, smooth on the under surface, lower ones oblong-spathulate; *racemes* paniculate, spreading, secund; *peduncles* pubescent. In moist woods, &c. Stem 2 feet high, virgate, angular, with leafy branches at top. Stem leaves sessile, an inch long; root leaves quite large. Racemes short, on the ends of the leafy branches, with large flowers. Sept. *Spread Goldenrod.*

22. S. NEGLE'CTA. *T. & G.*

Stem smooth; *leaves* rather thick, smooth, varying from ovate-lanceolate to narrow-lanceolate, tapering to both ends, feather-veined, entire, the lower and radical ones subserrate; *racemes* secund, dense, somewhat spreading, on elongated, slender, suberect branches, which are somewhat leafy at base; *achenia* smooth. Grows in swamps. Stems 2—4 feet high, straight, round, dividing at top into several nearly erect branches forming an elongated panicle. The leaves are sometimes nearly tripli-nerved, often very scabrous on the margin. Racemes short. Heads middle-size, 12—25 (8—12, *Gray*,) flowered. Scales obtuse. Aug. Sept.

23. S. ARGU'TA.

Stem erect, straight, smooth; *leaves* smooth, acutely and unequally serrate with diverging teeth, cauline ones elliptical, sessile, highest ones entire and small, radical ones oblong-ovate, attenuate at base into winged petioles; *racemes* paniculate, secund, dense; *heads* small, numerous; *rays* about 10. In meadows and woods. A smooth plant 2—3 feet high, with a large, dense, corymbose panicle of very numerous small heads. Racemes recurved, a finger's length, the compound pedicels roughish, bracted. Aug. Sept. *Sharp-notched Goldenrod.*

β. juncea; *leaves* lanceolate, lower ones serrate, upper ones entire; *stem* brownish, striate; *rays* twice as long as the involucre; *panicle* less dense.

24. S. MUHLENBE'RGHII. *T. & G.* S. arguta. *Muh.*

Stem furrowed, glabrous; *leaves* smooth both sides, strongly and sharply serrate, the radical ones ovate, petiolate, cauline ones elliptical-lanceolate, acuminate at each end; *racemes* secund, short, remote, axillary, spreading; *pedicels* pubescent; *heads* 15—20 flowered; *scales* linear, obtuse. In damp woods and thickets. Stem 2—3 feet high, generally simple, bearing a long, open panicle. Leaves large, notched with very acute or acuminate teeth, feather-veined. Heads middle size, with 6—8 rather large rays. Aug.—Sept.

25. S. ALTI'SSIMA.

Stem erect, hairy; *leaves* lanceolate, lower ones deeply serrate, rough and wrinkled. A very variable species, the tall, rough varieties of which are common about the borders of fields, in hedges, &c. Stem rough with hairs, erect, 3—5 feet high, much branched at top. Leaves variously toothed or serrate, numerous both upon the stem and branches. Branches widely spreading, each terminating in a recurved panicle with the flowers turning upwards. But scarcely two of the plants look alike. The branches are very widely spread, or but little diverging; with few and scattered flowers, or with numerous flowers; the leaves are equally or unequally serrate, hairy or woolly. Aug.—Oct. *Tall Goldenrod.*

26. S. ULMIFO'LIA.

Stem erect, smooth, striate; *leaves* ovate, deeply serrate, acuminate, villous beneath, radical ones obovate; *racemes* paniculate, secund; *peduncles* villous; *rays* about 4, short. In low grounds. Stem 3 feet high. Radical leaves hairy on both sides, stem leaves often oblong-ovate and hairy only near the veins beneath; all of them rather large. Aug. Sept.
Elm-leaved Goldenrod.

16. CHRYSO'PSIS.

Heads many-flowered; ray-flowers pistillate, disk-flowers perfect; involucre imbricate; receptacle subalveolate, flat; pappus double, the exterior short, interior copious, capillary; achenium hairy, compressed.

χρυσος, gold, οψις, appearance; on account of the showy heads of yellow flowers. Perennial, hairy herbs with alternate and entire leaves.

1. C. FALCA'TA. *Beck.* Inula falcata. *P.*

Woolly and villous; *leaves* sessile, linear, very acute, subfalcate, spreading; *nerves* pilose on both sides; *heads* in axillary corymbs; *involucre* pilose. A low, leafy plant with axillary, crowded corymbs of small, bright-yellow flowers. Rays 3-toothed at the end. The thick stem is about 8 inches in hight. Grows in pine barrens. Sept. Oct.

2. C. MARIA'NA. *Nutt.* Inula Mariana. *L.*

Hairy; *leaves* oblong, lanceolate, serrate, the upper ones sessile, acute, the lower ones spathulate and generally obtuse; *corymb* simple; *involucre* viscidly pubescent. Common in the Southern States, rare in N. Y. The stem and leaves are clothed with scattered, long, silky hairs. Plant about 2 feet high. Lower leaves taper at base into petioles. The corymb of flowers is terminal, nearly or quite simple. Heads large, 16—20 rayed, yellow, on viscid glandular peduncles. Aug.—Oct.

17. I'NULA.

Heads many-flowered; involucre imbricate; ray-flowers numerous, pistillate, disk flowers perfect; receptacle naked; pappus simple, scabrous; anthers with 2 bristles at base.

Coarse, perennial, European herbs, with alternate leaves and yellow flowers.

I. HELE'NIUM.

Leaves amplexicaul, ovate, rugose, downy beneath; *involucre scales* ovate. A large herbaceous, coarse looking plant, common by road-sides, naturalized. Stem 4—6 feet high, furrowed, branching and downy above. Radical leaves very large, 1—3 feet in length, and 6—12 inches wide, serrate, those of the stem clasping. Flowers large, solitary, terminal, of a bright yellow. Rays linear, with 2 or 3 teeth at the end. The medicinal virtues of the plant have long been esteemed. These are tonic and expectorant. Flowers in July and August. *Elecampane.*

Section III. Heads discoid.

18. PLU'CHEA.

Heads many-flowered, those of the margin pistillate, of the centre perfect but sterile; involucre imbricated; receptacle flat, naked; style undivided; pappus capillary, simple.

Strong-scented herbs with alternate leaves and corymbs of purple flowers.

P. CAMPHORA'TA. *Dc.* Conyza camphorata. *Muh.* C. Marilandica. *Mx.*

Leaves ovate-lanceolate, somewhat pubescent, acute, serrate, serratures mucronate; *flowers* in crowded corymbs. A fleshy, strong-scented plant, native of salt marshes. Stem a foot high, thick, downy, with alternate leaves and axillary branches. Flowers light purple. Aug. Per.

19. BACCHA'RIS.

Heads many-flowered, diœcious; involucre imbricate, cylindric or ovate, with subcoriaceous, ovate scales; sterile flowers with the stamens exserted; receptacle naked; pappus capillary.

The ancient Gr. name, from *Bacchus*, because dedicated to him. Shrubby plants with alternate leaves and white flowers.

B. HALIMIFO'LIA.

Shrubby; *leaves* obovate, incisely dentate above, the highest ones lanceolate; *panicle* compound, leafy; *fascicles* pedunculate. This is almost the only arborescent plant of this order found in the Northern States. It is 6—12 feet high, growing on sea coast, and river alluvion. Every part is covered with white dust. The fertile heads growing upon separate plants are in large, loose, terminal panicles, and furnished with very long, slender pappus. Corollas white. Sept. The beauty of this shrub entitles it to cultivation. *Groundsel Tree.*

TRIBE IV. SENECIONIDEÆ.

Heads radiate or discoid. Branches of the style linear, hairy or hispid at the apex which is either truncated or produced into a conical or elongated appendage. Leaves opposite or alternate.

Section I. Heads radiate.

20. A'RNICA.

Involucre of equal, lanceolate scales, 1 or 2 rowed; ray-flowers pistillate, disk perfect; receptacle flat, with scattered hairs; pappus simple, rigid and serrulate.

Said to be a corruption of the Lat. *ptarmica*, sneezing; one of the species is a violent sternutatory. Perennial herbs. Stems simple. Lvs. opposite. Fls. yellow.

A. MOLLIS. *Hook.*

Stem pubescent, erect; *leaves* pubescent, becoming nearly glabrous, thin, veiny, dentate, ovate-lanceolate and oblong; radical ones stalked; cauline, sessile; *heads* few; *involucre* hairy with acuminate scales; *achenia* hairy. An alpine plant found in ravines on the White Mts., and also, according to *Drs. Torrey & Gray*, on the Mts. in Essex Co., N. Y. Stem 1—2 feet high, with several pairs of sessile leaves, and 1—5 yellow heads of middle size. Leaves 2—5 inches in length, the upper ones broad at the base, the lower tapering to a winged petiole, often acute but not acuminate.

21. POLY'MNIA.

Involucre double, outer of 4 or 5 large, leafy scales. inner of 10 leaflets, concave; ray-flowers pistillate, few; disk sterile; receptacle chaffy; pappus none.

Polymnia is the name of one of the ancient Muses; why applied to this plant is not obvious. Perennial, clammy herbs. Lvs. opposite. Fls. yellow.

1. P. CANADE'NSIS.

Viscid-villous; *leaves* denticulate, petiolate, acuminate, lower pinnatifid, upper 3-lobed or entire. A coarse, broad-leaved, hairy-viscid plant, 3--5 feet high, at Niagara Falls and elsewhere. Stem with opposite leaves and spreading branches. Flowers light-yellow, the rays short, surrounded by the concave leaflets of the double calyx in such a manner as to form a sort of cup, hence called leaf-cup. Leaves feather-veined, 3--8 inches long, and nearly as wide, lobes deeply divided and acuminate. Heads half an inch in diameter. June. *Canadian Polymnia.*

2. P. UVEDA'LIA.

Leaves opposite, 3-lobed, acute, decurrent into the petiole, lobes sinuate-angled; *rays* elongated. In highland woods. Stem 3—6 feet high. Lower leaves very large. Flowers large, yellow, the rays much longer than the involucre. July. *Yellow Leaf-cup.*

22. ZI'NNIA.

Involucre scales oval, margined, imbricate; rays 5, persistent, entire, pistillate; disk flowers perfect; receptacle chaffy, conical; pappus of the disk of 2 erect awns.

Named for John Godfrey Zinn, a German botanist, 1557. Annual herbs, native at the South, &c. Lvs. opposite, entire.

1. Z. E'LEGANS.—*Heads* pedunculate; *leaves* cordate, ovate, sessile-amplexicaul; *stem* hairy; *chaff* serrated. Native of Peru. July, Aug. *Purple-flowered Zinnia.*

2. Z. MULTIFLORA.—*Heads* pedunculate; *leaves* ovate-lanceolate, on short stalks. Native of the Southern States. *Z. coccinea*, with brilliant scarlet flowers, and *Z. panciflora*, with bright yellow flowers, are also garden annuals well known among us. All the species are raised from seeds in a light, rich soil.

23. RUDBE'CKIA.

Ray-flowers neutral, disk perfect; involucre with a double row of leafy scales; receptacle conic, chaffy; pappus 0 or a 4-toothed margin.

Named after the celebrated Olaus Rudbeck, prof. of botany at Upsal, Sweden. Perennial herbs with large (usually yellow) flowers. Lvs. alternate. Scales 6 in each row. Fls. of the disk numerous, border 5-cleft, of the ray about 12, very long, lanceolate, flat, pendulous, with 2 or 3 terminal teeth.

1. R. LACINIA'TA.

Glabrous; *lower leaves* pinnate, segments 3-lobed; *upper ones* ovate; pappus crenate. In the edges of swamps and ditches. A tall, showy plant resembling the sunflower, from which, however, it is readily distinguished by its conical disk and its drooping rays. Stem round, branching, 6—8 feet high. Leaves attenuate, rough; upper ones generally ovate, the rest variously divided, toothed or cut, petiolate. Flowers large, terminal. Rays 1—2 inches long, oblanceolate, bright yellow. Aug. *Smooth Rudbeckia.*

2. R. HIRTA.

Very hirsute or hispid; *stem* simple or somewhat branched; *peduncles* naked; *leaves* ovate-spathulate, 3-nerved, petiolate, denticulate, the upper ones sessile, ovate-lanceolate; *involucre scales* numerous, narrow, imbricated in 3 rows; *rays* spreading. A beautiful flowering plant, in dry soils, Western N. Y., &c. Stems subsimple or branching from the base, covered with prickly prominences, each branch leafless towards the summit and bearing a large head with 12—15 bright yellow rays. These are an inch long, and surround a broadly conical disk of dark purple or dark brown chaff and flowers. July—Sept. *Rough Rudbeckia.*

ECHINACEA PURPUREA (*Mœnch*), the Rudbeckia purpurea of Linn. native of Virginia is a cultivated plant 4 feet high with singularly beautiful flowers. The rays are about 15, 2 or 3 inches in length, purple, pendulous. Disk conical, brown.

24. LE'PACHYS.

Involucre in one series of linear scales; ray-flowers few, neutral, disk perfect; receptacle columnar, chaffy; pappus 0; fertile achenia compressed, 1—2-winged.

Perennial herbs. Lvs. alternate, pinnately divided. Heads of flowers yellow, with long, drooping rays. Chaff obtuse and bearded at the summit.

L. PINNA'TA. *T. & G.* Rudbeckia pinnata. *Mx.*

Scabrous; *leaves* all pinnate, the divisions 3—7, some of the lower ones 2-parted, the rest undivided; *rays* elongated. In dry soil, Western N. Y. Stem 2—4 feet high, furrowed and hispid. Heads very large. Rays yellow, about 2 inches in length, reflexed, the disk ovate, purple.

25. HELIA'NTHUS.

Involucre imbricate, scales often leafy; ray-flowers neutral; disk perfect; receptacle chaffy, flat; pappus chaffy, 2-leaved, caducous; achenia compressed or 4-sided.

Gr. ηλιος, the sun, ανθος, a flower; from the resemblance of the flowers. The broad, round disk surrounded with golden rays render the *Sunflower* a fit emblem of the king of day. Lower leaves opposite. Fls. yellow.

* Leaves opposite.

1. H. STRUMO'SUS. *L.*

Stem smooth below, scabrous above; *leaves* ovate-lanceolate, acute serrate, scabrous above, smooth or tomentose-canescant beneath; *flowers* few, terminal. Grows in swamps, &c. Stem 3—5 feet high, erect, branching above. Leaves petiolate, with an acute point and close serratures, the lower surface varying in the degree of pubescence. Rays bright yellow, an inch or more in length. Scales hairy. July. Per. *Downy Sunflower.*

β. mollis (H. mollis, *Willd*); lower surface of the leaves very soft with whitish down.

2. H. DIVARICA'TUS.

Stem smooth, very branching; *leaves* nearly opposite, sessile, ovate-lanceolate, 3-nerved, scabrous above, smooth beneath; *panicle* trichotomous, slender, few-flowered. Not uncommon in rocky woods, brooksides, &c. Stem 5 feet high, glaucous. Leaves rather abrupt at base, tapering to a long, acute point, with obtuse serratures. Flowers large, although small for the genus, few, yellow and very showy. The panicle is either 2 or 3-forked. This plant is much improved by cultivation. Aug. Sept. Per. *Spreading Sunflower.*

3. H. FRONDO'SUS.

Stem smooth below; *leaves* opposite, ovate, acutely serrate; *peduncles* scabrous; *involucre* squarrose, undulate, leafy, ciliate; *rays* 8. In woods. Stem 3—5 feet high, with numerous 3-nerved leaves, which are rough on the upper surface, paler and nearly smooth beneath, and with a few remote and acute teeth. Flowers terminal, small, yellow. Aug. Per. *Leafy Sunflower.*

4. H. TRACHELIFO'LIUS.

Leaves opposite, ovate-lanceolate, on short petioles, serrate, acuminate, 3-nerved, very rough on both sides; *involucre scales* spreading at the ends, narrowly lanceolate, acute ciliate, pubescent; *rays* numerous. From 2 to 4 feet high, in hilly woods. Stem branching above into a loose panicle. Flowers middle size, with 12 or more rays. Aug. Sept. Per. *Dwarf Sunflower.*

5. H. DECAPE'TALUS.

Leaves opposite, ovate, acuminate, remotely serrate, 3-nerved, scabrous above, smooth or nearly so beneath; *involucre scales* lanceolate-linear, subciliate, spreading, nearly equal; *rays* 10—12, pale yellow. Stem 3—4 feet high, purplish. Involucre varying in all degrees of leafiness between the present form and the following. Aug. *Ten-rayed Sunflower.*

* * Upper cauline leaves alternate.

6. H. GIGA'NTEUS. *L.* H. altissimus.

Leaves alternate (the lowest opposite), lanceolate, acuminate, serrate, scabrous, obscurely 3-nerved, tapering at base into short, ciliate, winged petioles; scales of the *involucre* lanceolate-linear, ciliate. Stem 4—8 feet high, purplish,

branching above into a corymbose panicle of large, yellow flowers. Leaves large, opposite or alternate in various degrees. Rays 12—20. Variable. July—Sept. Per. *Tall Sunflower.*

7. H. A'NNUUS.

Leaves all cordate, 3-nerved, only the lowest opposite; *peduncles* thick; *flowers* nodding. This well known annual is from S. America. It grows in any soil, but its magnitude is increased by the fertility of it in direct proportion, until it reaches the hight of 10 and even 20 feet. The common hight may be stated at 7 feet. The enormous size of the flowers with their broad rays of brilliant yellow are too well known to require description. An edible oil has been expressed from the seeds. A variety occurs with double-flowers. July. *Common Sunflower.*

8. H. TUBERO'SUS.—*Leaves* 3-nerved, rough, lower ones opposite, cordate-ovate; upper, ovate, acuminate, alternate; *petioles* ciliate at base. Native of Brazil. The plant has been cultivated for the sake of its tuberous roots which are used as a substitute for potatoes. It is naturalized in borders of fields, hedges, &c. Sept. Per. *Jerusalem Artichoke.*

26. SANVITA'LIA.

Involucre closely imbricated; receptacle chaffy, conical; achenia of the ray with 3 awns, of the disk winged.

Name given by Lamark without explanation. Annual Texian or Mexican herbs with opposite leaves and yellow-rayed flowers.

S. PROCU'MBENS.—*Stem* procumbent; *leaves* ovate, entire. Native of Mexico. Flowers from June to Sept. Of a spreading dwarf habit. A foot in length. Flowers yellow. Pretty in patches. *Trailing Sanvitalia.*

27. TAGE'TES.

Heads heterogamous; involucre simple, tubular, of 5 united scales; ray-flowers 5, persistent; receptacle naked; pappus of 5 erect awns.

Named for Tages, a Tuscan divinity, son of Genius and grandson of Jupiter. Annual herbs of Tropical America.

1. T. PA'TULA.—*Leaves* pinnate, leaflets lanceolate, ciliate-serrate; *peduncles* 1-flowered, thickened upwards; *involucre* smooth; *stem* spreading. Plant about 2 feet high. Flowers orange and yellow. *French Marigold.*

2. T. ERE'CTA.—*Leaves* pinnate, leaflets lanceolate, ciliate-serrate; *peduncles* 1-flowered, ventricose; *involucre* angular; *stem* erect. Nearly all the species of the marigold are natives of S. America and Mexico. Well known and popular garden flowers, with several varieties. *African Marigold.*

28. HELE'NIUM.

Involucre double, the outer of leafy, narrow scales, the inner chaffy; rays pistillate; pappus of several 5-awned, chaffy leaves; receptacle globose, naked in the disk and chaffy in the ray only; ray-flowers half 3-cleft; seed villose.

Named for the celebrated Helen, who is said to have availed herself of the cosmetic properties of the plant. Lvs. alternate, decurrent. Rays yellow.

H. AUTUMNA'LE.

Leaves lanceolate-serrate, smooth or slightly pubescent, decurrent; *flowers* loosely corymbose. In damp places. Stem 2—3 feet high, branching, strongly winged by the decurrent leaves. Leaves tapering to each end or elliptic-lanceolate, more or less deeply serrate. Flowers large, numerous, terminal, with drooping rays, each ending in 3 obtuse teeth, and longer than the large, globose disk. The plant is very bitter. Aug. Per. *Sneeze-wort.*

29. A'NTHEMIS.

Involucre hemispherical, with nearly equal scales; rays numerous, pistillate; receptacle chaffy, convex or conic; achenia crowned with a slight border.

Gr. ἄνθος, a flower, on account of the multitude of flowers with which the plants are covered. European herbs with much divided leaves.

1. A. ARVE'NSIS.

Receptacle conic; *chaff* lanceolate; *seeds* crowned with an entire marginal pappus; *leaves* bipinnate, subdivided, the segments linear-lanceolate, acute. Grows in dry cultivated fields. A pilose, inodorous plant, somewhat naturalized in the Northern States. Stems diffusely branching, 8—15 inches high. Heads large, solitary on the leafless, downy summits of the branches. Disk yellow, rays white. July. Bien. *Corn Chamomile.*

2. A. NO'BILIS.—*Scales* of the *receptacle* membranous, scarcely longer than the disk; *leaves* bipinnate, the segments linear-subulate, a little downy. Native of Britain and other parts of Europe. Grows wild occasionally in fields and is cultivated in gardens. The strong and agreeable scent of the chamomile is well known, also its tonic and anodyne qualities, which chiefly reside in the flowers. July—Sept. Per. *Chamomile.*

30. MARU'TA.

Involucre hemispherical, imbricated; rays neutral; disk perfect; receptacle conical, chaffy (at least at the summit); pappus 0; achenia smooth.

European herbs, naturalized. Lvs. alternate, much divided.

M. CO'TULA. *Dc.* Anthemis Cotula. *L.*

Receptacle conic; *chaff* bristly; *achenia* naked; *leaves* doubly pinnatifid, smoothish. The Mayweed is naturalized in all waste places in hard, dry soils, especially by roadsides, in patches of great extent, presenting almost a uniform whitish surface when in blossom. Stem branching, diffuse, a foot high, with alternate leaves divided and subdivided into a multitude of segments. Flowers solitary, on terminal, striated stalks. The plant is ill scented. Linnæus says it is grateful to toads, drives away fleas, and is annoying to flies. June —Sept. Ann. *May-weed.*

31. ACHI'LLEA.

Involucre ovate, imbricate, unequal; rays 5—10, short, pistillate; receptacle flat, chaffy; achenia without a pappus.

Named after Achilles, a disciple of Chiron, said to be the first physician who used it in healing wounds. Perennial herbs with much-divided, alternate leaves.

1. A. MILLEFO'LIUM.

Leaves bipinnatifid, with linear, dentate, mucronate segments; *involucre* and *stem* furrowed. The yarrow abounds in fields, pastures, &c. It is called also Millfoil, from its leaves being cut and parted into so numerous divisions and subdivisions. Stem a foot high, branching at top into a dense, flat-topped corymb of white or rose-colored flowers. It has an agreeable, pungent taste and smell. June—Sept. Per. *Yarrow. Millfoil.*

2. A. PTA'RMICA.

Leaves linear, acuminate, equally and sharply serrate, smooth. Found in moist grounds and shady places. Plant about 15 inches high, branching at top into a diffuse corymb of white flowers. The leaves are remarkably distinct from the yarrow. The dried powder of the leaves used as snuff provokes sneezing. A variety with double flowers occurs which is quite ornamental in pots. Aug. Per. *Sneeze-wort.*

32. LEUCA'NTHEMUM.

Involucre broad, depressed, imbricated; rays pistillate, numerous; receptacle flat, naked; achenia striate; papus 0.

Gr. λευκος, white, ανθος, flower; the flowers are large, with white rays and a yellow disk. Lvs. alternate.

L. VULGA'RE. *Lam.* Chrysanthemum laucanthemum. *L.*

Leaves amplexicaul, lanceolate, serrate, cut-pinnatifid at base; *stem* erect, branching. The common white-weed is a great annoyance to farmers, rapidly overspreading pastures and neglected fields. Stems 2 feet high, simple or with one or two long branches, furrowed. Leaves comparatively few and small, obtuse, the lower ones petiolate, with deep and irregular teeth; upper ones small, subulate, those of the middle sessile, clasping, deeply cut at base, with remote teeth above. Flowers large, terminal, solitary. Disk yellow. Rays numerous, white. July—Sept. Per. *White-weed. Ox-eye Daisy.*

33. PYRE'THRUM.

Involucre hemispherical, imbricate; scales with membranous margins; receptacle naked; pappus a membranous margin crowning the achenia.

The ancient Greek name of a certain plant supposed to have been a species of Anthemis. Its root had an acrid, burning taste and hence the name, from πυρ, fire. Oriental herbs, chiefly perennial, with alternate leaves.

P. PARTHE'NIUM.—*Leaves* petiolate, flat, tripinnate, the segments ovate, cut; *peduncles* branching, corymbose; *stem* erect; *involucre* hemispherical, pubescent. Several varieties of the Feverfew are cultivated, and are in great favor with many florists, on account of their fine pyramidal form, surmounted with a corymb of pure white, double flowers, which retain their beauty for several weeks. *Feverfew.*

34. CHRYSA'NTHEMUM.

Involucre imbricate, hemispherical, the scales with membranous margins; receptacle naked; pappus 0.

Gr. χρυσος, gold, ανθος, a flower; many species bearing golden colored flowers. An ornamental genus from China and other eastern countries. Leaves alternate, lobed.

1. C. CORONA'RIUM.—*Leaves* bipinnatifid, broader at the summit, acute; *stem* branched. Native of Sicily. The variety with double flowers is frequently cultivated as a hardy annual. Stem about 3 feet high, striate, smooth, erect, with alternate, clasping leaves. Flowers large, terminal, solitary. Aug. Ann.

2. C. TRI'COLOR.—*Leaves* bipinnate, fleshy, smooth; *involucre scales* carinate. Native of Barbary. Flowers large, very beautiful; disk purple, rays white with a yellow base. A variety has flowers entirely yellow. July—Oct. Ann. *Three-colored Chrysanthemum.*

3. C. SIE'NSE.—*Leaves* coriaceous, stalked, sinuate-pinnatifid, dentate, glaucous; *rays* very long. A native of China, where it has been long cultivated and highly esteemed for its beauty. A great number of varieties have been produced, with double, semidouble and quilled flowers of every possible shade of color. It is of very easy culture in any common soil. The plants are propagated by divisions, by suckers and by cuttings. Although they grow in any soil, yet it is better to give them a rich loam and water them with liquid manure. *Chinese Chrysanthemum.*

35. HELIO'PSIS.

Involucre imbricate, with ovate, subequal scales; rays linear, large, pistillate, disk perfect; receptacle chaffy, conical, the palæ lanceolate; achenia 4-sided; pappus 0.

Gr. ηλιος, the sun, οψις, an appearance. The flowers are similar to those of the sunflower, and like them are not unaptly likened to the sun. Perennial herbs with large heads of yellow flowers and opposite leaves.

II. LÆVIS.

Stem smooth; *leaves* ovate-oblong, serrate, petiolate, 3-nerved, smooth beneath. A large symmetrical plant, 3—5 feet high, in hedges and thickets. Stem angular, striate. Leaves large, distinctly 3-nerved. Branches axillary, each thickened at the summit and terminating with a large, solitary, yellow head. Rays lanceolate, broad at base and obtuse at summit. Jn., Jl. *Ox-eye.*

Section II. Heads radiate and discoid in the same genus.

36. COREO'PSIS.

Involucre double, each 6—10-leaved; receptacle chaffy; achenia compressed, emarginate, each commonly with a 2-toothed pappus.

Gr. κορις, a bug, οψις, resemblance; the seed is concave on one side and convex on the other; it has a membranous margin and 2 little horns at one end which give it much the appearance of some insect. Lvs. mostly opposite. Rays rarely wanting.

1. C. TRICHOSPE'RMA.

Stem smooth, dichotomous; *leaves* opposite, quinate-pinnate, lanceolate, serrate; leaflets of the outer calyx ciliate; *rays* entire; seeds cuneate. In wet grounds. A smooth, branching plant with large, bright yellow flowers. Stem 2 feet high with branches and leaves mostly opposite. Leaflets 5—7, narrow and tapering to a long point, the margin more or less deeply cut into a

few remote serratures. The seeds (achenia) are half an inch long and crowned with 2 stout, hispid awns. July—Aug. Bien. *Tick-seed Sunflower.*

2. C. RO'SEA. *Nutt.*

Stem branched; *leaves* opposite 1-nerved, linear, entire; *peduncles* short; *outer scales* very short; *rays* obscurely tridentate. A very delicate species in wet grounds, Ms., rare. Stem about a foot high, clothed with numerous, very narrow leaves, and bearing a few small heads. Rays rose-color, varying to white. Disk light yellow. July—Aug. Per. *Rose-red Tick-seed.*

3. C. TINCTO'RIA.—*Radical leaves* sub-bipinnate, leaflets oval, entire, smooth; *cauline ones* subpinnate, leaflets linear; *rays* 2-colored; *seeds* naked. This species, with us, is a handsome border annual, native of Missouri. Stem 1—3 feet high, with light, smooth foliage. Flowers with yellow rays beautifully colored with purple at their base. Flowering all summer. Another species, *C. Drummondii*, is also a popular border flower, blossoming all summer. Plant a foot or more high, with yellow flowers. Of this there is a new variety, *atrosanguinea*, with dark-orange flowers. All these species and varieties are raised from seed in a light rich soil.

37. BIDENS.

Involucre nearly equal, double, scaly or leafy at the base; rays few, neutral; disk perfect; receptacle chaffy, flat; pappus of 2—4 awns, rough backwards.

Lat. *bidens*, two toothed; the seeds have two (or more) barbed teeth. Leaves opposite. Involucre scales parallel, concave or channelled on the back. Rays often wanting. Achenia quadrangular.

1. B. CE'RNUA.

Flowers subradiate, cernuous; *outer involucre* as long as the flower; *leaves* lanceolate, subconnate, dentate. In swamps and ditches. Stem 1—2 feet high, purplish, branched, round at base, striate above, branches opposite, leaves opposite, somewhat connated at base. Flowers yellowish green, finally drooping, generally with yellow rays about 8 in number. Aug.—Oct. *Water Burr-Marigold.*

2. B. CHRYSANTHEMOI'DES.

Flowers radiate; *rays* three times as long as the nearly equal involucre; *leaves* oblong, attenuate at each end, connate at base, dentate. A low plant with large yellow-rayed flowers, in muddy places. Stem 6—20 inches high, round and smooth. Leaves smooth, with few remote teeth, narrow, opposite, with narrow connate bases. Flowers commonly erect, rays about 8, large, spreading. Scarcely distinct from *B. cernua*. Sept. Oct. Ann. *Radiate Burr-Marigold.*

3. B. FRONDO'SA.

Flowers discoid; *outer involucre* 6 times as long as the flower, its leaflets ciliate at base; *lower leaves* pinnate; *upper ones* ternate, lanceolate, serrate. A common weed in moist, cultivated fields, often called beggar-ticks, from the 2-horned achenia which adhere to every one who passes by it. Stem 2 feet high, sending out many spreading branches. Lower leaves in 3s or 5s. Flowers in clusters at the end of the branches, without rays, yellow, surrounded by a large and leafy involucre. Aug. Sept. Ann. *Leafy Burr-Marigold.*

4. B. CONNA'TA. *Muh.* B. tripartita. *Bw.*

Flowers discoid; outer involucre longer than the flower; *achenia* with 3 awns; *leaves* trifid. In swamps and ditches. Stem 1—3 feet high, smooth and 4-furrowed, with opposite branches. Leaves opposite, smooth, serrate, the lower ones often divided into 3 segments, the rest generally entire, lanceolate, sharply serrate and somewhat connate. Flowers terminal, solitary, without rays, consisting only of the tubular, yellow florets surrounded by a leafy involucre. Aug. Ann. *Trifid Burr-Marigold.*

5. B. BIPINNA'TA.

Smooth; *flowers* subradiate, *outer involucre* the length of the inner; *leaves* bipinnate, leaflets lanceolate, pinnatifid. Grows in waste places, 1—4 feet high. Stem branching, smooth. Leaves nearly smooth, bipinnately dissected. Heads with 3 or 4 obscure rays. July. Ann. *Spanish Needles.*

38. SENE'CIO.

Involucre of many equal leaflets or invested with scales at base, the scales withered at the points; receptacle not chaffy; pappus simple.

Lat. *senex*, an old man. The word is synonymous with Erigeron. An extensive genus of herbs or shrubs. Lvs. alternate. Fls. mostly yellow. Corollas longer than the involucre.

* Heads discoid.

1. S. VULGA'RIS.

Stem paniculate, erect, angular; *leaves* sinuate-pinnatifid, dentate, amplexicaul. A common weed growing about houses, in waste grounds, rubbish, &c. Introduced from Europe. Stem 18 inches high, leafy, branching generally smooth. Leaves alternate, thin, bright green, the radical ones stalked. Flowers without rays, terminal, scattered, yellow, appearing all summer. Ann. *Common Groundsel.*

* * Heads radiate.

2. S. AU'REUS.

Radical leaves ovate, cordate, serrate, petiolate; *cauline ones* pinnatifid, dentate, terminal, segments lanceolate; *peduncles* subumbellate, thick; *rays* 8—12. A handsome, but very variable plant, with bright yellow flowers, in meadows, woods, &c. Stem smoothish, erect, 1—2 feet high, simple, terminating in a kind of umbellate corymb. Lower stem leaves lyrate. Flower stalks thickened upwards. Scales smooth, acute, purplish at the apex. Rays spreading. May—Aug. Per. *Golden Senecio.*

β. Balsamitæ (S. Balsamitæ *Muh*); *radical leaves* oblong-lanceolate, crenate-dentate, petioled; *upper ones* lyrate and pinnatifid, sessile; *peduncles* subumbellate. Stem about a foot high, nearly naked, densely woolly at base, with a terminal umbel of yellow flowers. Leaves pubescent, all small and distant. Flower-stalks villous at the base. Found in rocky hills and pastures.

γ. gracilis (S. gracilis *P.*); *radical leaves* very long petioled, orbicular, subcordate, crenate; *cauline ones* few, very serrate, linear oblong, dilated at base, cut-dentate; *peduncles* very short. hairy, subumbellate; *involucre* smooth; *rays* few, very short. A slender state of the species a foot high, with small flowers. Found on rocky shores.

δ. obovatus; radical leaves obovate, crenate-serrate, petiolate; *stem leaves* pinnatifid, dentate; *peduncles* elongated. Found in meadows, &c.

3. S. E'LEGANS.—Leaves pilose, viscid, pinnatifid, equal, spreading; *common petiole* narrowed below. Native of the Cape of Good Hope. Linnæus gave to this annual the name of *elegans* on account of the beauty of its flowers, their rays being of the most brilliant purple and the disk yellow. A variety is cultivated in gardens and the green house with double flowers, of colors equally brilliant. Another double variety has white flowers. June—Aug. *Purple Jacobæa.*

Section III. Heads discoid.

39. ERE'CHTITES.

Flowers all tubular, those of the margin pistillate, of the disk perfect; involucre cylindrical, simple, slightly calyculate; receptacle naked; pappus of numerous fine, capillary bristles.

Gr. ερεχθω, to trouble; the species are troublesome weeds. Marginal corollas very slender, 2—3-toothed. Branches of the style tipped with a pubescent cone. Ach. striate. Annual herbs, with simple, alternate leaves and corymbs of whitish flowers.

E. HIERACIFO'LIUS. *Raf.* Senicio hieracifolius. *L.*

Stem paniculate, virgate; *leaves* oblong, amplexicaul, acute, unequally and deeply toothed with acute indentures; *involucre* smooth; *achenia* hairy. A well known, rank weed, growing in fields, particularly and abundantly in such as have been newly cleared and burnt over, and hence it is called fire-weed. Stem thick and fleshy, branching, 3 feet high, roughish. Leaves of a light green, large, irregularly cut into many deep and acute teeth. Flowers terminal, crowded, destitute of rays, white. Involucre large and tumid at base. Aug. Sept. Ann. *Fire-weed.*

40. CACA'LIA.

Flowers all perfect; involucre cylindric, oblong, often calyculate with small scales at the base; receptacle not chaffy; pappus capillary, scabrous.

An ancient Greek name of an uncertain plant. Smooth, perennial herbs Lvs. alternate. Hds. of fls. corymbose, cyanic.

1. C. SUAVE'OLENS.

Glabrous; *stem* striate-angular; *leaves* petiolate, hastate-sagittate, serrate, smooth, green on both sides; *flowers* corymbed, erect; *involucre* many-flowered. Western N. Y. Stems 4—5 feet high, striate, leafy. Radical leaves on long stalks, pointed; cauline ones on winged stalks. Flowers whitish, in a terminal, compound corymb. Scales and peduncles, smooth, with setaceous bracts beneath the involucre, and beneath the divisions of the peduncles. Aug. Per. *Wild Caraway.*

2. C. ATRIPLICIFO'LIA.

Stem herbaceous; *leaves* petiolate, smooth, glaucous beneath, radical ones cordate, dentate, cauline ones rhomboid, sub-bidentate on each side; *flowers* corymbed, erect; *involucre* 5-flowered. N. Y. Stem 3—5 feet high, round, leafy, subramose. Leaves alternate, the lower ones as large as the hand, with large, unequal teeth. Heads of flowers small, ovoid-cylindric, whitish, loosely corymbose at the tops of the branches. Jl.—Sept. *Orache-leaved Caraway.*

3. C. COCCI'NEA.—*Radical leaves* ovate, spathulate; *cauline ones* entire, amplexicaul, crenate. A pretty exotic garden plant, a foot or more high,

with bright scarlet flowers. A bed or patch sown thickly makes a fine appearance. June—Sept. Per. *Scarlet-flowered Cacalia.*

41. ARTEMI'SIA.

Involucre ovate, imbricate, with dry, connivent scales; receptacle naked or subvillous; achenia with a small disk; pappus 0.

Probably from *Artemis*, one of the names of the goddess Diana. Disk-flowers numerous, perfect, tubular, 5-cleft, those of the ray few, often without stamens, and with an awl-shaped corolla, or none. Bitter herbs. Leaves alternate. Cor. yellow.

1. A. CANADE'NSIS.

Stem erect or decumbent; *leaves* pinnatifid with linear segments; *flowers* subglobose, sessile, in crowded panicles resembling spikes. Grows on the sandy shores of the great lakes. Stem 3—4 feet high, brownish, somewhat woody, paniculate, mostly erect. Radical leaves subpinnate; cauline ones once or twice pinnatifid. Scales of the involucre with a membranaceous margin. Aug. Per. *Sea Wormwood.*

2. A. VULGA'RIS.

Leaves tomentose beneath, cauline ones pinnatifid, segments lanceolate, acute, subdentate, floral ones entire, linear-lanceolate; *heads* erect, ovoid, subsessile; *involucre* tomentose. On the banks of streams, &c. Stem 2—3 feet high branching into a panicle of spicate racemes. Leaves very variable. Flowers purplish. Sept.—Nov. *Common Artemisia.*

3. A. ABSI'NTHIUM.

Leaves multifid, clothed with short, silky down, segments lanceolate; *heads* hemispherical, drooping; *receptacle* hairy. Naturalized in the mountainous districts of New England, growing among rubbish, rocks and by roadsides. Stems angular, branched, with erect racemes of nodding, yellow flowers. The whole plant is proverbially bitter, and of powerful medicinal qualities as a tonic, stomachic, &c. *Common Wormwood.*

4. A. ABRO'TANUM.—*Stem* erect; *lower leaves* bipinnate; *upper ones* capillary, pinnate; *involucre* downy, hemispherical. A well known shrubby plant in gardens, about 3 feet high. Leaves alternate much divided into very narrow, linear segments. Flowers numerous, nodding, yellow. Native of South Europe. *Southernwood.*

5. A. PO'NTICA.—*Leaves* downy beneath, cauline ones bipinnate, leaflets linear; *heads* roundish, stalked, nodding. Common in gardens, where it arises 3 or 4 feet, with simple branches and racemes of yellow flowers. Head with 24 flowers, those of the ray about 6. From Austria. *Roman Wormwood.*

42. GNAPHA'LIUM.

Heads discoid, heterogamous, involucre imbricate, with scarious, colored scales; receptacle flat, naked; pappus simple, scabrous, capillary; ray-flowers subulate.

Gr. γναφαλον, cotton or wool; from the soft cottony surface of the plant. Marginal flowers pistillate, in several rows, central ones perfect. Leaves decurrent.

1. G. POLYCE'PHALUM.

Leaves linear-lanceolate, acute, smooth above, downy beneath; *stem* panicled, downy; *corymbs* terminal. This species is very common, and is distinguishable by its strong, agreeable odor and its brownish color. Grows in fields, &c. Stem 1—2 feet high, whitish, with a cottony down, much branched. Leaves sessile, cottony beneath. Flowers in crowded clusters at the ends of the branches. Involucre with whitish scales and yellow flowers. Aug. Ann. *Fragrant Life-everlasting.*

2. G. PURPU'REUM. *L.* G. Americanum. *Willd.*

Stem erect, simple or branched from the base, tomentose; *leaves* linear-spathulate or obovate-spathulate, downy-canescent beneath, green above; *flowers* sessile, crowded, terminal and axillary. Grows in sandy fields and pastures. Stem 8—12 inches high, sending out shoots at the base. Heads with purplish scales and yellow corollas. Jn. Ann. *Purple Life-everlasting.*

3. G. ULIGINO'SUM.

Stem much branched, branches woolly, spreading; *leaves* linear lanceolate; *heads* in terminal, leafy, crowded branches; *achenia* smooth. A small, diffuse plant, clothed with whitish down, common in pastures, roadsides and cultivated grounds. Stem 4—6 inches high, involucre scales oblong, obtuse, yellowish. Aug. Ann. *Marsh Gnaphalium.*

β. pilulare (G. pilulare *Wahl.*); achenia minutely hispid, scabrous.

4. G. DECU'RRENS. *Ives.*

Stem erect, stout, much branched, viscidly pubescent; *leaves* linear-lanceolate, very acute; *decurrent* naked above, white and woolly beneath; *flowers* in dense, roundish, terminal clusters. A stout species, covered with a dense, hoary pubescence. It grows in hilly pastures, &c. Stem 2 feet high, with scattered leaves and spreading branches. Leaves on the upper side green, scabrous and viscid. Scales whitish, with yellow corollas. Aug. Per. *Decurrent-leaved Life-everlasting.*

43. ANTENNA'RIA.

Heads diœcious; involucre of imbricate, colored scales; pistillate corollas filiform; receptacle subconvex, alveolate; pappus simple, bristly.

Name in allusion to the awns of the pappus which resemble the antennæ of some insect. Heads covered with conescent down. Lvs. alternate.

1. A. MARGARITA'CEA. *Br.* Graphalium margaritaceum. *L.*

Herbaceous; *leaves* linear-lanceolate, acuminate, alternate; *stem* branched at top; *corymbs* fastigiate; *flowers* pedicelled. This common plant derives its singular appellation from the imperishable nature of its dry pearl-white flowers. Grows in fields and pastures, 1 or 2 feet high, all parts covered with a white, cottony down. Stem round, erect, with numerous, sessile, scattered leaves, branching at top into a flat-topped, crowded corymb. Involucre scales white, with yellow flowers. The plant is slightly fragrant. Aug. Per. *Common Life-everlasting.*

2. A. PLANTAGINIFO'LIA.

Stotons procumbent; *stem* simple; *radical leaves* ovate, mucronate, 3-nerved, silky-canescent. A small, early-flowering species, common in dry woods and hilly pastures. The whole plant is tomentose-canescent. Leaves of the radical shoots larger than the rest; those of the stem sessile. Flowers

in a small, terminal corymb, woolly, and of a purplish white. The flowers of some plants are all barren, of others all fertile. April—Sept. Per.
Mouse-ear Life-everlasting.

44. FI'LAGO.

Heads heterogamous; involucre of few villose scales; marginal flowers pistillate; receptacle columnar, naked at the summit, chaffy at base; achenia terete, the central ones with a hairy pappus.

Downy-canescent herbs, apparently named from the Lat. *fila*, thread, from its cottony-like fibres or hairs. Leaves alternate, entire. The scales of the involucre pass insensibly into those of the columnar receptacle, each embracing a pistillate flower in its axil.

F. GERMA'NICA. *L.* Gnaphalium. Germanica. *P.*

Woolly tomentose; *stem* dichotomous or proliferously branched above; *leaves* linear-lanceolate, acute, crowded, erect; *heads* few-flowered, in dense, capitate clusters, terminal and lateral; *scales* cuspidate, the outer ones woolly. A European plant introduced into our roadsides, old fields, &c., but not very common. The stem is 6 to 10 inches high, often branching above from the midst of the globose cluster of heads. Leaves numerous, less than an inch in length, sessile, woolly on both sides. Scales straw-colored, with a green line outside. July—Oct. Ann. *Cudweed.*

45. TANACE'TUM.

Involucre hemispherical, imbricate, the scales all minute; receptacle convex, naked; pappus a slight, membranous border; achenia with a large epigynous disk.

A corruption of *Athanasia*, which is from the *Gr.* α, privative, and θανατος, death; from the durability of the flowers. Lvs. alternate, much dissected. Fls. yellow.

T. VULGA'RE.

Leaves doubly pinnate, incisely serrate. The common tansey is native of Europe, naturalized in old fields, roadsides, &c. Stems 2—3 feet high, terminating in handsome corymbs of yellow flowers. A variety with dense and crisped leaves occurs, called *double tansey.* The whole plant has a strong, aromatic smell and very bitter taste. The seeds are anthelmintic. Aug. Per. *Tansey.*

46. AMMO'BIUM.

Heads homogamous; involucre imbricate, colored, radiant; anthers with 2 bristles at base; receptacle distinctly chaffy; pappus a toothed edge.

Gr. αμμος, sand, βιω, to live; referring to the place of its nativity in New-Holland.

A. ALA'TUM.

Leaves oblong, wavy, decurrent. Native of New-Holland. A pretty herbaceous, half hardy plant of easy culture in any garden soil. The stalks are branched, 2 feet high, curiously winged by the decurrent leaves. Heads solitary, terminal, with dry, white, involucral scales. Per. *Winged Ammobium.*

Tribe V. CYNAREÆ.

Heads ovoid, discoid, rarely radiate, homogamous (rarely diœcious), or heterogamous with the marginal flowers in a single series. Style in the perfect flowers often tumid near the summit.

47. CALE'NDULA.

Heads radiate; involucre of many equal leaves, in about 2 series; receptacle naked; achenia of the disk membranaceous; pappus 0.

Lat. *Calenda*, the first day of the month, because this plant blooms every month in the year. An oriental genus of annual herbs.

C. OFFICINA'LIS.—*Achenia* carinate, muricate, incurved. A common and handsome garden plant, from S. Europe. It has double, lemon-colored and other varieties. The flower is commonly orange-colored. "It yields a distilled water, a kind of vinegar, and a conserve. The stem and leaves are good in soups and broths." June—Sept. Ann. *Pot-Marigold.*

48. CENTAU'REA.

Heads discoid; involucre imbricate; ray-flowers larger than the rest, sterile, often wanting; receptacle bristly; pappus hairy; achenia compressed.

It is said that with this plant the *Centaur* Chiron cured the wound made in his foot by Hercules. A genus of Eastern plants with alternate leaves.

C. NIGRA.

Involucre scales ovate, with an erect, capillary fringe; *lower leaves* angular-lyrate; *upper ones* ovate. Introduced from Europe. A troublesome weed in meadows and pastures. Stem branching, 2 feet high. Flowers large, purple, terminal, solitary. July, Aug. Per. *Knapweed.*

C. CY'AMUS.

Involucre scales serrate; *leaves* linear, entire, the lowest ones dentate. Native of Europe. A hardy annual, justly popular for its beautiful flowers, which are very variable in color. It is sparingly naturalized in old fields. July—Sept. *Blue-bottle. Bachelor's Button.*

C. MOSCHA'TA.—*Involucre* roundish, smooth, scales ovate; *leaves* lyrate dentate. A handsome border annual from Persia. Flowers purple. A variety has white flowers. July—Oct. *Sweet Sultan.*

S. SUAVE'OLENS.—*Involucre* round, smooth; *lower leaves* broad, subspathulate, dentate; *upper ones* lyrate at base; *flowers* yellow, sweet-scented. From Levant. *Yellow Sweet Sultan.*

49. CNICUS.

Heads discoid; involucre ventricose, imbricate with doubly spinous scales; ray-flowers sterile; receptacle very hairy; pappus in three series, the outer 10-toothed, the 2 inner each 10-bristled.

Gr. κνίζω, to prickle; well applied to this herb.

C. BENEDI'CTA.—*Involucre* doubly spinous, woolly, bractate; *leaves* somewhat decurrent, dentate, spiny. Native of Spain. Its peculiar names are in consequence of its early reputation for curing fever, plague and cancers. It is at present in no estimation whatever. Naturalized in fields. June. Ann *Blessed Thistle.*

C. SOLSTITIA'LIS.—*Involucre* palmate-spinous, terminal, solitary; *spine* straight; *leaves* lanceolate, decurrent, without prickles, radical ones lyrate. From Europe. Said to be naturalized. *St. Barnaby's Thistle.*

50. ONOPO'RDON.

Heads discoid, homogamous; involucre ventricose, imbricate with spreading, spinous scales; receptacle deeply alveolate; pappus copious, capillary, scabrous; achenia 4-angled.

Gr. ονος, and περδω; the application of which to the present noble genus is not obvious. Large branching herbs with decurrent leaves.

O. ACA'NTHIUM.

Involucre scales spreading, subulate; *leaves* ovate-oblong, decurrent, sinuate, spinous, woolly on both sides. This fine looking thistle occurs naturalized in waste grounds, and is about 3 feet in hight. The whole plant has a white, cottony appearance. Stem winged by the decurrent leaves which are unusually large. Involucre round, cottony, spinous. Flowers purple. July, Aug. Bien. *Cotton Thistle.*

51. CYNA'RA.

Heads discoid, homogamous; involucre dilated, imbricate, scales fleshy, emarginate, pointed; receptacle setaceous; pappus plumose; achenia not beaked.

Gr. κυων, a dog; the stiff, hard spines of the involucre resemble the teeth of a dog. Natives of the Old World.

1. C. SCO'LYMUS.

Leaves subspinose, pinnate and undivided; *involucre scales* ovate. Native of S. Europe, naturalized in gardens and cultivated grounds. A well-known garden esculent. The parts used are the receptacle, the lower part of the involucre and the upper portion of the stalk. It is cultivated from suckers placed in rows, 3 feet apart. Aug. Sept. Per. *Garden Artichoke.*

2. C. CARDU'NCULUS.—*Leaves* spiny, all pinnatifid; *involucre scales* ovate. Native of Candia. Flowers purple. This plant is blanched by having earth heaped up around it, and then the petioles become tender, crisp and eatable, like celery. Aug. Sept. Per. *Cardoon.*

52. CI'RSIUM.

Heads discoid, homogamous; involucre subglobose, of many rows of spinose-pointed, imbricated scales; receptacle bristly; style scarcely divided; pappus copious, plumose; achenia compressed, smooth.

Gr. κιρσιον, is a name given by Pliny to a certain kind of thistle. Herbs with alternate leaves generally armed with spinose prickles. Flowers cyanic.

1. C. ARVE'NSE. *Scop.* Cnicus arvensis. *P.*

Leaves sessile, pinnatifid, spinous; *stem* panicled; *involucre* round or ovate, with minute spines, scales close pressed, ovate-lanceolate. A very common thistle in fields, roadsides and waste places. It is one of the severest pests of the farmer, requiring his constant vigilance to extirpate it from his fields. In England it is called *cursed thistle.* Root creeping, very long and exceedingly tenacious of life. Stem 3 feet high, with a branching panicle at top. Leaves alternate, thickly beset with thorns. Flowers rather small, purple, the involucre nearly thornless, and is the only part of the plant that can be safely handled. July. Per. *Canada Thistle.*

2. C. DI'SCOLOR. *Spreng.* Cnicus discolor. *Muh.*

Leaves sessile, pinnatifid, rough-haired, downy beneath, the segments 2-lobed, divaricate, spinose; *involucre* globose, the scales ovate, appressed, with spreading spines at the tips. A slender thistle, 3—5 feet high, much branched, and leafy at the summit. Found in thickets. Heads terminating the branches, an inch in diameter, with reddish purple corollas. July, Aug. Bien. *Tall Thistle.*

3. C. MU'TICUM. *Mx.* Cnicus glutinosus. *Bw.*

Leaves pinnatifid with divaricate segments; *involucre* ovate, with unarmed, villous-arachnoid, glutinous scales. A fine-looking thistle found in damp soils. Stem branching, 3—7 feet high. Leaves armed with spines at each angle. Heads half an inch in diameter, with deep purple corollas, the scales webbed and glutinous on the back. Aug. Sept. Bien. *Glutinous Thistle.*

4. C. HORRI'DULUM. *Mx.* Cnicus horridulus. *Bw.*

Leaves sessile, pinnatifid, acutely cut, spinose; *heads* invested with an external involucre of about 20 very spinose bracts; *scales* unarmed. Found in meadows, &c. The stem is 1—3 feet high, invested with wool. Leaves somewhat clasping, woolly and hairy, armed with stiff spines. Heads large, with yellowish-white corollas surrounded by a whorl of lanceolate or linear leaflets tipped with stiff thorns, the scales webbed. Aug. Bien. *Yellow Thistle.*

5. C. PU'MILUM. *Spreng.* Cnicus odoratus. *Muh.*

Hairy; *leaves* green on both sides, clasping, oblong-lanceolate, pinnatifid, the segments irregularly lobed, ciliate, spinose; *involucre* round ovate, spinose, naked. A common, low, turgid thistle in roadsides, pastures, &c. Stem 1—2 feet high, stout, striate, with 1—3 very large heads of fragrant, purple flowers. Aug. Bien. *Pasture Thistle.*

6. C. LANCEOLA'TUM. *Scop.* Carduus lanceolatus. *L.* Cnicus lanceolatum. *P.*

Leaves decurrent, pinnatifid, hispid, the segments divaricate and spinose; *involucre* ovate, villous; *scales* lanceolate, spreading. Common in borders of fields, roadsides, &c., always distinguished by the decurrent leaves. Stem 3—4 feet high, winged by the decurrent leaves which are white and woolly beneath, armed with formidable spines at all points. Flowers numerous, large, purple. Involucre scales webbed, each ending in a spine. July—Sept. Bien. *Common Thistle.*

53. LAPPA.

Heads discoid, homogamous; involucre globose, the scales imbricated and hooked at the extremity; receptacle bristly; pappus bristly, scabrous, caducous.

Lat. *lappa,* a burr, from Gr. λαβειν, to lay hold of; a term well characterizing the burdock. Coarse European herbs. Root biennial. Leaves alternate, large.

L. MAJOR. *Gaert.* Arctium Lappa. *L.*

Leaves cordate, unarmed, petioled. Common in waste and cultivated grounds, fields, &c. Every one must necessarily be acquainted with the burdock. Each plant is a large, conical, ill-scented and coarse looking mass of vegetation, surmounted by a branching, irregular panicle of ovate heads with tubular corollas of an exceedingly delicate pink color. The leaves are very large with wavy edges. This plant is an instance of design in the disseminating of seeds, such as cannot be mistaken. The scales of the involucre all end in a minute, firm hook, which seizes hold of every thing that passes by. Thus men and animals are made the unwilling agents of scattering widely the seeds of this unsightly plant. July. Aug. *Burdock.*

54. IVA.

Heads discoid; involucre 3-leaved; marginal flowers 5, fertile, the others sterile; receptacle hairy; achenia obconic, obtuse; pappus 0.

A name of barbarous origin. Herbs or shrubs. Lower leaves opposite.

I. FRUTE'SCENS.

Leaves lanceolate, punctate, deeply serrate, rough; *stem* shrubby. In the borders of salt marshes. Stem thick, 3—8 feet high, with numerous opposite branches. Leaves numerous, 3-nerved, upper ones entire. Flowers green, small, drooping, in close, leafy clusters. Aug. Per. *High-water Shrub.*

55. XA'NTHIUM.

Heads heterocephalous. *Sterile.*—Involucre imbricate; anthers approximate, but distinct; receptacle chaffy. *Fertile.*—Involucre 2-leaved, clothed with hooked prickles, 1 or 2 beaked, 2-flowered; stamens 0.

Gr. ξανθος, yellow; a color which Dioscorides asserted to be communicated to the hair by an infusion of these plants. Coarse, annual weeds, with alternate leaves.

1. X. STRUMA'RIUM.

Stem unarmed, branching; *leaves* cordate, lobed, 3-nerved, unequally serrate, rough; *fruit* elliptical, armed with uncinate, stiff thorns, and ending with 2, spreading, straight horns. A coarse, rough plant, in old fields, &c. Stem branched, bristly, spotted, 2—3 feet high. Leaves large, on long stalks, rigid. Sterile flowers few together, terminal, globular, green. Fertile in sessile, axillary tufts. Fruit a hard, 2-celled burr, near an inch long, covered with stiff, hooked prickles, which, like those of the common burdock, serve to disperse the seeds. Aug. Ann. *Clot-weed.*

2. X. ECHINA'TUM. *Murray.* X. macrocarpon. *Dc.*

Stem rough and strigose, spotted; *leaves* scabrous, obscurely lobed, obtuse, broad and subcordate at base, repand-toothed; *fruit* oval, densely armed with rigid, uncinate bristles; *horns* incurved. A very coarse plant in marshes near the seacoast. Stem thick 1—2 feet high. Fruit very large, hairy. Aug.—Oct.

3. X. SPINO'SUM.

Stem branching; *leaves* ovate-lanceolate, somewhat 3-lobed, armed with ternate spines at the base of the stalks. Waste grounds, Ms. Heads few, axillary, sessile. Sept.—Nov. *Prickly Clot-weed.*

56. AMBRO'SIA.

Heads heterocephalous. *Sterile.*—Involucre of several united scales, hemispherical, many-flowered; anthers approximate, but distinct; receptacle naked. *Fertile.*—Involucre 1-leaved, entire or 5 toothed, 1-flowered corolla 0; styles 2; stamens 0.

Αμβροσια, signifies in Greek, the food of the gods; a term strangely misapplied in these herbaceous weeds. Lvs. generally opposite.

1. A. TRI'FIDA.

Hairy, rough; *leaves* three lobed, serrate, the lobes oval-lanceolate, acuminate; *fruit* with 6 lines below the summit. A very tall, herbaceous plant, not very common, found in hedges and low grounds in the valley of Connecticut river. Stem 5—10 feet high, erect, branching, furrowed. Leaves opposite, in 3 large, deep lobes with long points and close serratures. Flowers mean and obscure, in long, leafless spikes, axillary and terminal. Aug. Ann. *Trifid-leaved Ambrosia.*

2. A. ARTEMISIÆFO'LIA. *L.* A. elatior. *P.*

Leaves twice-pinnatifid, nearly smooth; *petioles* ciliate; *racemes* terminal, panicled; *stem* virgate. A common and troublesome weed of the gardens, &c., far more worthy of its English than its Latin name. Stem 2—3 feet high, branching, pubescent when young. Leaves with segments acute and parallel. Barren flowers, small, green, in terminal racemes, the fertile ones sessile about the axils of the upper leaves. Aug. Sept. Ann. *Hog-weed.*

β. integrifolia, (*T. & G.* A. integrifolia, *Muh*). *Leaves* ovate, acuminate, serrate, bristly on both sides, ciliate at base, often some of them 3-lobed; *racemes* terminal, single or ternate.

SUBORDER II. LIGULIFLORÆ.

Flowers all perfect, ligulate, in a radiatiform head.

TRIBE VI. CICHORACEÆ.

Branches of the style uniformly pubescent. Plants with a milky juice. Leaves alternate.

57. CICHO'RIUM.

Involucre double, the outer of 5 leafy scales, the inner of about 8 linear ones; receptacle chaffy; pappus scaly; achenia not rostrate, obscurely 5-sided.

The ancient Egyptian name was *chikourych*, whence Gr. κιχωρη, and Eng. *Succory.* Oriental herbs with bright blue flowers, about 20 in a head.

C. I'NTYBUS.

Flowers in pairs, axillary, sessile; *lower leaves* runcinate. A European plant 2—3 feet high, with large, showy, sky blue flowers, naturalized in grass fields, by roadsides, and becoming quite common in many localities. Stem round, with few long branches, rough. The upper leaves become cordate-

acuminate, sessile, inconspicuous, only the radical ones runcinate. The flowers are 1—2 inches in diameter, and placed rather remote on the long, nakedish branches. Corollas flat, 5-toothed. The root is used in France as a substitute for coffee. July—Sept. Per. *Succory.*

58. KRI'GIA.

Involucre many-leaved, nearly simple, equal; receptacle naked; pappus double, or consisting of 5 broad, membranous scales surrounding 5—8 bristles several times as long as the 5-angled achenia.

Named after Dr. Krieg, a German botanist, who accompanied Mr Vernon (see Vernonia) to America in search of plants. Small acaulescent herbs. Heads solitary with 20—30 yellow flowers.

K. VIRGI'NICA. *Willd.* Hyoseris Virginica. *L.*

Scape 1-flowered; *leaves* lanceolate, lyrate, smooth; *involucre* smooth. This little plant is found on sandy hills and by roadsides, flowering from May to July. Scapes 1—several, smooth, slender, 1—8 inches high. After flowering it becomes longer than the leaves. The primary leaves are roundish, entire; the rest irregularly lyrate. Scales of the involucre 10—15, linear-lanceolate, arranged in a somewhat simple series. Corollas yellow. Achenia turbinate, scabrous, reddish brown. Ann. *Dwarf Dandelion.*

59. CY'NTHIA.

Involucre nearly simple, of equal, narrow scales; receptacle flat, alveolate; pappus double, the outer minute, scaly; inner copious, capillary; achenia short.

Cynthia in heathen mythology was one of the names of Diana. Its application to these plants is not very obvious. Leaves alternate or radical. Heads with 12—15 yellow flowers.

C. VIRGI'NICA.

Stem mostly simple, scape-like; *radical leaves* sublyrate or pinnatifid, on short, winged petioles; *cauline ones* lanceolate, amplexicaul, entire. In sandy soils, Western N. Y. The plant is smooth and glaucous. Stem 1—2 feet high, often dichotomously divided, with 1—2 clasping leaves at the forks. Radical leaves 3—5 inches long, sometimes nearly entire. Heads terminal on the bracteate and subumbellate peduncles, with deep yellow flowers. Scales united at base in a somewhat double series. May—July.

Virginian Cynthia.

60. TRAGO'POGON.

Involucre simple, of many leaves; receptacle naked; pappus plumose, achenia longitudinally striate, contracted into a long, filiform beak.

Gr. τραγος, a goat, πωγων, beard; in allusion to the long, silky, tawny beard of the fruit. Biennial European herbs, with long, linear, grass-like leaves.

T. PORRIFO'LIUS.—*Involucre* much longer than the corolla; *leaves* long, linear, undivided, straight; *peduncle* thickened upwards. Stem 3—4

feet high. Flowers terminal, solitary, large, bluish purple. This exotic is cultivated in gardens for the root, which is long, tapering and nutritious. When properly prepared it has a mild, sweetish taste, which has been compared to that of the oyster. Bienn. *Salsify. Vegetable Oyster.*

61. LEO'NTODON.

Involucre imbricate, the outer scales very short; receptacle naked; pappus plumose, persistent on the somewhat rostrate achenia.

Gr. λεων, a lion, and οδους, a tooth; in reference to the deep, tooth-like divisions of the leaves. Acaulescent herbs, with white flowers, many in a head.

L. AUTUMNA'LIS. *L.* Apargia autumnalis. *Willd.*

Scape branching; *peduncles* scaly; *leaves* lanceolate, dentate-pinnatifid, smoothish. A European plant, naturalized and common in the eastern parts of N. England, growing in grass-lands and by roadsides. The flower resembles those of the dandelion (Taxaxacum). Root large, abrupt. Scape round, striate, hollow, decumbent at base, 6—18 inches high, with a few branches and scattered scales. Leaves all radical spreading, 6 inches long, with deep, round sinuses, and covered with remote hairs. Flowers an inch in diameter, yellow, appearing from July to Nov. *Autumnal Hawkweed.*

62. LACTU'CA.

Involucre imbricate, cylindric, the scales in 2 or 3 rows, the outer shortest; receptacle naked; pappus simple, crowning the long beak of the achenia.

Lat. *lac*, milk; from the milky juice, in which all the species abound. Heads few-flowered. Pappus copious, soft and white.

1. L. ELONGA'TA.

Leaves smooth and pale beneath, lower ones amplexicaul, runcinate, upper lanceolate, entire, sessile; *heads* racemose-paniculate. A common, rank plant, growing in hedges, thickets, &c., where the soil is rich and damp. Stem hollow, stout, 3—6 feet high, often purple, bearing a leafless, elongated, sometimes corymbose-spreading panicle of numerous heads of flowers. Leaves very variable, the lower 6—12 inches long, commonly deeply runcinate, often narrow-lanceolate, with a few narrow-lanceolate divisions. Corollas yellow. Achenia oblong, compressed, about the length of the beak. July, Aug. *Wild Lettuce. Trumpet Milkweed.*

β *integrifolia* (L. integrifolia. *Bw.*); *leaves* nearly all undivided, lanceolate, sessile, the lowest often sagittate at base.

γ. *sanguinarea* (L. sanguinarea. *Bw.*); *leaves* runcinate, amplexicaul, mostly pubescent, glaucous beneath; *flowers* purple. Stem 2—3 feet high, often purple (but this character is not peculiar to this variety).

2. L. SATIVA.—*Stem* corymbose; *leaves* suborbicular, the cauline ones cordate. The varieties of this exotic are every where well known and cultivated for salad. It is annual, with very smooth, yellowish green foliage, which in one variety (*capitata*) is so abundant as to form heads like the cabbage. Heads numerous, small, with yellowish corollas. The milky juice contains opium, and if this salad be eaten too freely, unpleasant narcotic effects are the consequence. *Garden Lettuce.*

63. TARA'XACUM.

Involucre double, the outer of small scales much shorter than the inner, appressed row; receptacle naked; achenia produced into a long beak crowned with the copious, white, capillary pappus.

Gr. ταραακτικος, cathartic; on account of its once celebrated medicinal properties. Acaulescent herbs, with runcinate leaves.

T. DENS-LEONIS. *Desf.* Leontodon Taraxacum. *L.*

Outer scales of the involucre reflexed; *leaves* runcinate, smooth, dentate. Every one is acquainted with the dandelion, which is found growing in all open situations, and blossoming at all seasons except winter. The leaves are all radical, and examples of that peculiar form termed runcinate, that is, re-uncinate, the teeth or claws inclining backwards towards the base of the leaf rather than the summit. Scape hollow, round, bearing a single yellow flower. After the flower is closed and decayed, the scape rises higher and bears a head of perfected seeds and seed-down, the airy, globular form of which is very conspicuous among the tall grass. The leaves in spring furnish an excellent pot-herb. April—Nov. Per. *Dandelion.*

64. NA'BALUS.

Involucre cylindric, of many linear scales in one row, calyculate with a few short, appressed scales at base; receptacle naked; pappus copious, capillary, brownish, 2-rowed, persistent; achenia not beaked, smooth, striate.

Erect herbs with a thick, tuberous and bitter root. Heads 5—15-flowered, not yellow, though often straw-colored or cream-colored.

* Heads pendulous. Leaves very variable in the same species.

1. N. ALBUS. *Hook.* Harpalyce. *Don.* Prenanthes. *L.*

Stem smooth and somewhat glaucous, corymbose-paniculate above; *radical leaves* angular-hastate, often more or less deeply lobed; *stem leaves* roundish-ovate, dentate, petioled, the lobes or leaves obtuse; *heads* pendulous; *involucre* of 8 scales, 9—12-flowered. A conspicuous and not inelegant plant, in moist woods and shades. Stem stout, 2—4 feet high, purplish, often deeply so in spots. The leaves are very variable, the lowest 3—5-lobed or only hastate, the uppermost lanceolate, and between these the intermediate forms, hastate and ovate, all irregularly toothed. Scales purplish. Corollas whitish. Pappus brown. Some of the varieties have the reputation of curing the rattle-snakes' bite. Aug. Per. *Lion's foot. White Lettuce.*

β. serpentaria (Prenanthes serpentaria. *P*); *radical leaves* palmate-sinnate, those of the stem on long petioles, with the middle segment 3-parted; *upper leaves* lanceolate.

2. N. ALTI'SSIMUS. *Hook.* Harpalyce. *Don.* Prenanthes. *L.*

Stem smooth, slender, straight, paniculate above; *leaves* more or less deeply 3—5-cleft, all petiolate, angular, denticulate and rough-edged, the lobes acuminate; *heads* pendulous; *involucre* of 5 scales and about 5-flowered. A tall species with cylindric, yellowish, nodding flowers, found in woods. Stem 3—5 feet high, bearing a narrow and elongated panicle. Heads in short, axillary and terminal racemes. Aug. Per. *Tall Nabalus.*

β. *ovatus* (*Riddell*); *cauline leaves* nearly all ovate, on slender petioles.

γ. *cordatus* (Prenanthes cordata. *Willd*); *leaves* cordate, on slender petioles.

δ. *deltoidea* (Prenanthes deltoidea. *Ell.*); *leaves* deltoid, acuminate, acutely denticulate.

ε. *dissectus* (*T. & G.*); *leaves* mostly 3-parted or divided, segments entire or deeply cleft into 2 or 3 narrow lobes.

3. N. FRA'SERI. Prenanthes rubicunda. *P.*

Stem smooth, corymbosely-paniculate above; *leaves* subscabrous, mostly deltoid, often pinnately lobed, on winged petioles, the upper ones lanceolate, subsessile; *involucre* of about 8 scales, 8—12-flowered; *pappus* straw-colored. In dry, hard, soils, rare. Stem 2—4 feet high with paniculate branches. The leaves are as variable as in our other species, sometimes all being lanceolate, with only irregular indentures instead of lobes. Heads drooping, with purplish scales and cream-colored corollas. It is most effectually distinguished from N. albus by the more lively color of the pappus. Aug. Per.

4. N. NANUS. Prenanthes alba. β. nana. *Bw.*

Stem simple, low, smooth; *leaves* on slender petioles, the lowest variously lobed or parted, the others successively deltoid-hastate, ovate and lanceolate; *heads* in small axillary and terminal clusters, forming a slender, racemose panicle; *involucre* greenish purple, of about 8 scales and 10—12 flowers; *pappus* dingy white. This form of Nabalus is common on the White Mts., where we find it with the same sportive character of foliage as appears in other species. Stem 5—10 inches high. Heads with whitish flowers. Aug. Sept.

65. SONCHUS.

Involucre imbricate, dilated at base; receptacle naked; pappus of simple, copious, white-silky hairs; achenia not rostrate.

Said to be from the Gr. σομφος, hollow or soft; in allusion to the soft, feeble stem of the plant. Involucre scales numerous, linear, unequal. Heads many-flowered, yellow. Lvs. often spinulose.

1. S. OLERA'CEOUS.

Leaves sagittate amplexicaul, runcinate, subspinulose, dentate; *pedancles* downy; *involucre* at length smooth. A sordid looking plant, native of Europe, naturalized in waste grounds, among rubbish, &c. The whole plant has a glaucous hue. Stem angular, hollow, fragile, 2—3 feet in hight. Leaves apparently clasping, with large retreating lobes at base, wavy and serrated in a runcinate manner, the teeth ending in weak spines. Involucres dilated at base, with yellow corollas. Sept. Ann. *Common Sow-Thistle.*

2. S. ASPER. *Vill.* S. spinulosus. *Bw.*

Stem glandular-hispid above; *leaves* cordate-amplexicaul, oblong-lanceolate, undulate, spinulose, dentate; *peduncles* subumbellate. Hanover, N. H. Found in similar situations with the former, but less common. Stem 1—2 feet high, smooth except at the summits of the branches, where it is covered with stiff hairs, each supporting a little gland at top. Leaves with numerous short, spiny teeth, wavy or slightly runcinate, the upper ones clasping so as to appear perfoliate. Scales with few, scattered hairs. Aug. Sept. *Rough Sow-Thistle.*

3. S. ARVE'NSIS.

Involucre and *peduncles* hispid, subumbelled; *leaves* runcinate, denticulate, cordate at the base; *root* creeping. Cultivated grounds. Stem about 2 feet high, angular. Flowers large, deep yellow. Aug. Per. *Corn Sow-Thistle.*

66. HIERA'CIUM.

Involucre more or less imbricated, ovate; receptacle subfavose; pappus simple, hairy, copious, persistent; achenia not beaked.

Gr. ἱεραξ, a *hawk;* from the exploded notion that the hawk and other birds of prey made use of the juice of this plant to strengthen their vision. Involucre many-flowered, with very unequal scales.

1. H. VENO'SUM.

Scape naked, smooth, paniculate; *leaves* obovate, somewhat acute, entire, a little hairy above, nearly glabrous beneath, ciliate on the margins, the veins colored; *involucre* glabrous. Found in woods, &c. Leaves all radical, spreading on the ground, remarkably distinguished with dark red spots and veins. Scape or stem 1—2 feet high, nearly or quite naked, of a dark brown color, bearing a diffuse, terminal, corymbose panicle of rather small heads on slender pedicels and with bright yellow flowers. Achenia linear. July, Aug. Per. *Veiny-leaved Hawkweed.*

2. H. GRONO'VII.

Stem leafy, hirsute, paniculate; *involucre* and *pedicels* glandular-pilose; *radical leaves* obovate or oblanceolate, entire, strigose, the midrib beneath very villous; *upper ones* oblong, closely sessile. A hairy plant, found on dry hills. Stem about 2 feet high, furnished with a few leaves below, naked above and bearing a narrow, elongated panicle. Lower leaves tapering into a long stalk. Flowers yellow, on glandular, slender pedicels. Achenia tapering upwards to a slender point, but scarcely rostrate. Aug. Sept. Per. *Gronovius' Hawkweed.*

3. H. CANADE'NSE. *Mx.* H. Kalmii. *Spr.*

Stem erect, subvillose, leafy, many-flowered; *leaves* sessile, lanceolate or oblong-ovate, acute, divaricately and acutely dentate, the upper ones somewhat amplexicaul, with an obtuse base; *panicles* axillary and terminal, corymbose, downy. Rocky woods. Stem 1—2 feet high, more or less pubescent. Flowers large and showy, yellow, on thick, downy pedicels. Aug. Per. *Canadian Hawkweed.*

4. H. PANICULA'TUM.

Smoothish; *stem* erect, leafy, whitish tomentose below; *pedicels* capillary; *heads* 10—18-flowered; *leaves* lanceolate, dentate, naked, membranaceous. About a foot in hight, found in damp woods. Stem slender. Leaves thin. Heads quite small, numerous on long, slender pedicels, forming a very branching panicle. Aug. Per. *Panicled Hawkweed.*

5. H. SCABRUM. *Mx.* H. Marianum. *Willd.*

Stem erect, villous; *leaves* elliptic-obovate, with stiff bristles, and villous on the midrib, the lower ones slightly dentate; *pedicels* and *calyx* downy; *heads* 25—40-flowered. A rough species, found on sandy hills. Stem about 2 feet high, very rough, round, striate, bearing at top a small dense panicle of yellow flowers. Leaves sessile, with a broad, rounded point. Pedicels and calyx glandular-hispid. Aug. Per.

6. H. AURANTI'ACUM. —*Stem* leafy, hispid; *flowers* densely corymbose; *leaves* oblong, somewhat acute, pilose, hispid. Native of Scotland. Flowers numerous, large, orange-colored. One of the few species worthy of cultivation. Per.

67. MULGEDIUM.

Involucre double, the outer series short, imbricated; receptacle naked; pappus copious, soft, capillary, crowning the short-beaked achenia.

Lat. *mulgeo*, to milk; in allusion to the lactescent qualities of the plants.

1. M. ACUMINA'TUM. *Dc.* Sonchus acuminatus. *Willd.*

Radical leaves subruncinate; *cauline ones* ovate, acuminate, petiolate, dentate; *heads* loosely paniculate, on somewhat scaly peduncles. In hedges and thickets. A smooth plant, 3—6 feet high, with the stem often purplish. Leaves 3—6 inches long, the lower ones often deltoid-hastate or truncate at the base, sinuate-denticulate, narrowed at base into a winged petiole. Heads small. Peduncles with a few scale-like bracteoles. Scales dark purple, with blue corollas. Pappus white, on the short-beaked (ovate-acuminate) achenia. Aug. Sept. *Acuminate-leaved Mulgedium.*

2. M. LEUCOPHÆ'UM. *Dc.* Sonchus floridanus. *Ait.* Agathyrsus leucophæus. *Don:*

Leaves numerous, lyrate-runcinate, coarsely dentate; *heads* paniculate on squamose-bracteate peduncles. Moist thickets. A tall, leafy plant, nearly smooth. Stem 4—10 feet high. Leaves 5—12 inches long, irregularly divided in a runcinate or pinnatifid manner, the segments repand-toothed, the radical ones on long stalks, the upper ones sessile, often undivided. Heads small, with pale blue or yellowish corollas, a dirty white pappus, and arranged in a long, slender panicle. Aug. Sept. *Shining Mulgedium.*

ORDER LXXVII. LOBELIACEÆ. *The Lobelia Tribe.*

Cal.—Superior, the limb 5-lobed or entire.
Cor.—Limb irregular, 5-lobed, the tube inserted into the calyx.
Sta.—5, inserted with the corolla and alternate with its lobes.
Anth.—Coherent into a tube. *Pollen* oval.
Ova.—Adherent to the calyx tube. *Style* simple. *Stig.* surrounded with a fringe.
Fr.—A capsule, 2 or 3-(rarely 1-)celled, many-seeded.

Herbs, sometimes shrubs, with alternate, exstipulate leaves. They are most abundant in countries near the tropics, as W. Indies, Brazil and the Sandwich Islands, but they are found also throughout the temperate zones.

Properties. All the species are poisonous, being pervaded by an acrid, narcotic juice. The common *Indian tobacco* (Lobelia inflata) is an exceedingly active medicine, emetic, sudorific and expectorant. It should be used, however, with great caution, since "less than a teaspoonful of the seeds or the powdered leaves would destroy life in a few hours." *Dr. Gray.* The other species produce similar effects, but in a less degree.

This order contains comparatively few genera and is represented in the Northern States by the following genus only.

LOBELIA.

Corolla tubular, irregular, cleft nearly to the base on the upper side; stamens with the anthers united above into a curved tube; stigma 2-lobed; capsule opening at the summit; seeds minute.

Named in honor of Matthias de Lobel, physician and botanist to James I. Died at London, 1616. Herbaceous plants. Flowers solitary axillary, or in terminal, bracted racemes. The corolla limb is apparently 2-lipped, the lower lip of 3, spreading, lanceolate segments, the upper of 2 smaller segments.

1. L. CARDINA'LIS.

Stem erect; *leaves* broad-lanceolate, serrate; *racemes* terminal, secund. A tall plant of superior beauty, native of our meadows and streams. It has been introduced abroad, and is highly prized by the florists of Europe. The stem is commonly 2 feet high; but by the railroad side west of Utica, numerous plants of this species occur 3 and 4 feet. The leaves (as well as the whole plant) are smooth, alternate, ovate-lanceolate, becoming minute among the flowers. At the top of the stem there are about a dozen large, scarlet flowers, on axillary peduncles. In favorable circumstances their number increases to near a hundred, forming a superb racemose spike, equalling in length and excelling in beauty the proudest plume that the warrior ever wore. July, Aug. Per. *Cardinal flower.*

2. L. INFLA'TA.

Stem hairy, branched, erect; *leaves* ovate-lanceolate, sessile, serrate, pilose; *capsule* inflated. Root fibrous. Stem erect, very rough, angular, simple, becoming branched in proportion to the luxuriance of its growth, 10—15 inches high. Leaves elliptical, sessile, hairy and veiny. Flowers in leafy spikes, axillary, peduncled. Corolla small, pale blue, leaving an oval, turgid capsule in the calyx. Grows every where in pastures and roadsides. This plant has been rendered famous by the Thompsonian doctors, in whose practice it constitutes the "grand catholicon" for the cure of "all diseases." Its specific action, as above stated, is that of a violent emetic. In small doses it is powerfully expectorant. To its salivating property is probably owing the drivelling of horses in autumn. July—Sept. Ann. *Indian Tobacco.*

3. L. DORTMA'NNA.

Leaves linear entire, fleshy, 2-celled; *scape* simple, naked, racemose. A curious aquatic, growing in ponds, the flowers only rising above the water. Stem erect, hollow, nearly leafless, long, bearing above the surface a raceme of 3 or 4 remote, pedicellate flowers. Leaves mostly radical, spreading, obtuse, submerged, having 2 longitudinal grooves. Flowers drooping, pale blue. July. Per. *Water Lobelia.*

4. L. SIPHILI'TICA.

Leaves ovate-oblong, unequally serrate; *calyx* hairy, shorter than the tube of the corolla, the sinuses reflexed. A fine, showy plant, but inferior in beauty to L. cardinalis, growing in wet meadows. Stem erect, 2—4 feet high, simple, angular, with short hairs. Leaves lanceolate, broader at base, acute at each end, somewhat erosely dentate, pilose. Flowers large, on short peduncles, each solitary in the axil of an ovate-lanceolate bract. Corolla bright blue or purplish. Capsule half superior. Jl. Per. *Blue Cardinal flower.*

5. L. PUBE'RULA.

Pubescent; *stem* erect, simple; *leaves* ovate-oblong or elliptical, obtuse, sessile, repand-denticulate; *raceme* spicate, secund; *calyx* ciliate, the segments longer than the tube of the corolla. Native of mountains, &c. Stem 12—30 inches high, scarcely furrowed. Leaves covered with a short, downy or silky pubescence, 1—2 inches in length and half as wide, the lower ones broadest towards the end. Flowers large, on very short pedicels, each solitary

in the axil of an ovate-lanceolate bract, forming a somewhat one-sided raceme, leafy below. Calyx hairy at base. Corolla of a bright, purplish blue. Jl. Per.

6. L. CLAYTO'NIA. *Mx.* L. palida. *Muh.*

Leaves oblong, sessile, pubescent, nearly entire, the radical ones spathulate; *stem* erect, simple, pubescent; *raceme* spicate. Pastures and roadsides. Plant slender 1½—2 feet high, pubescent or nearly smooth. Stem somewhat grooved, few-leaved, ending in a long, wand-like raceme. Flowers numerous, on short pedicels, crowded, each axillary to a linear-lanceolate bract. Corolla pale blue. Calyx segments subulate, long as the tube of the corolla. Aug. Per. *Clayton's Lobelia.*

7. L. KA'LMIA.

Smooth; *stem* simple, slender, erect; *radical leaves* spathulate, *stem leaves* linear-lanceolate, obtuse, remotely denticulate; *raceme* lax, few-flowered, leafy; *flowers* pedicelled. A small and delicate species, inhabiting the rocky banks of streams. Stem 6—12 inches high, commonly simple. Leaves mostly linear, sessile, an inch long and 1—2 lines wide, upper ones entire, lower with minute teeth. Flowers remote, alternate, on axillary pedicels which are but little shorter than the leaf-like bracts. Corolla pale blue, the 3 lower segments obovate. Aug. *Kalm's Lobelia.*

L. SPLENDENS and FULGENS, natives of Mexico, both with scarlet flowers, are two other brilliant ornaments of this genus. They are occasionally cultivated, as well as L. cardinalis. They require copious supplies of water, in sanded bog-earth.

ORDER LXXVIII. CAMPANULACEÆ. *The Bell-flower Tribe.*

Cal.—Superior, generally 5-cleft, persistent.
Cor.—Regular, campanulate, generally 5-cleft, withering, valvate in æstivation. [lobes.
Sta.—Inserted with the corolla upon the calyx, equal in number to, and alternate with, its
Anth.—Distinct, 2-celled. *Pollen* spherical.
Ova.—Adherent to the calyx, 2 or more-celled. *Style* covered with collecting hairs.
Fr.—Capsule crowned with the remains of the calyx, loculicidal. *Seeds* many.

Herbs with a milky juice. Leaves alternate, exstipulate. Flowers mostly blue, showy. It is a small order, chiefly abounding in the northern temperate zone and in South Africa. Of its 300 species, according to Alphonse DeCandolle, only 19 inhabit the torrid zone. The campanulaceæ are interesting chiefly for their beauty, being destitute of any important known properties. They are represented among us by a single genus.

CAMPA'NULA.

Calyx mostly 5-cleft; corolla campanulate, 5-lobed, closed at base by 5 stameniforous valves; stigma 3—5-cleft; capsule 3—5-celled, opening by lateral pores.

A Latin diminutive, from *campana*, a bell; a term singularly applicable to the elegant form of the flowers. The divisions of the stigma, as well as the cells of the capsule are very generally 3. Seeds numerous and small.

1. C. ROTUNDIFO'LIA.

Stem weak, slender; *radical leaves* reniform-cordate; *cauline ones* linear, entire; *flowers* few, nodding. An exceedingly delicate plant, with blue, bell-shaped flowers. On damp rocks and rocky streams. Stem a foot or more high, smooth. The root leaves decay on the opening of the flowers, so that only those of the stem are then visible. These are rather numerous,

smooth, linear, 2 inches long and scarcely a line in width. Flowers terminal, in a loose panicle, drooping. Root creeping, perennial. June, July.
Common Bell-flower. Hair Bell.

2. C. AMPLEXICAU'LIS. *Mx.* C. perfoliata. *L.*

Stem simple, rarely branched, erect; *leaves* cordate, crenate, amplexicaul; *flowers* sessile, aggregate, axillary. Plant somewhat hairy, a foot high, found in fields and roadsides. The strict, upright stem, is furnished with distant, short, alternate, heart-reniform, veiny, stem clasping leaves, containing 1—4 crowded flowers in the concavity of their upper surface. Flowers axillary and terminal, the upper clusters larger. Corolla blue or purple, with spreading segments, calyx segments acute, lanceolate. June, July. Ann.
Stem-clasping Bell-flower.

3. C. APARINOI'DES. *P.* C. erinoides. *Mx.*

Stem flaccid, slender, branching above, triangular, the angles inversely aculeate; *leaves* linear-lanceolate; *flowers* terminal. A slender annual, found in wet meadows. Stem 12—18 inches high, its 3 angles rough backwards, by means of which it supports itself upright among the grass. Leaves smooth on the upper surface, denticulate, the margin and nerves rough backwards. Flowers small, white, on thread-like, flexuous peduncles at the top of the stem. June—Aug. *Prickly Bell-flower.*

4. C. AMERICA'NA.

Stem erect; *leaves* ovate-lanceolate, acuminate, uncinately serrate, the lower ones often cordate; *petioles* ciliate; *flowers* axillary, sessile; *style* exsert. A tall, erect, ornamental species in fields, hills, &c., in Western N. Y. and Penn. Also cultivated in gardens. Stem 2—3 feet high, nearly smooth. Leaves ending in a long point, smooth, with fine teeth. Flowers blue, flat, on short stalks or sessile, numerous, solitary or several in each upper axil, forming a terminal, leafy raceme. Corolla spreading. Aug. Per.
American Bell-flower.

5. C. ME'DIUM.—*Stem* simple, erect, hispid; *leaves* lanceolate, obtusely serrate, sessile, 3-nerved at base; *flowers* erect. An ornamental border flower, from Germany, and of the easiest culture. Root biennial. Stem several feet in hight, undivided, rough with bristly hairs. Flowers very large, the base broad, limb reflexed, of a deep blue. Several varieties occur with double or single flowers, of blue, red, purple and white corollas. June—Sept.
Canterbury Bell.

6. C. SPE'CULUM.—*Stem* diffuse, very branching; *leaves* oblong-crenate; *flowers* solitary; *scales* at the base of the corolla sometimes wanting. A pretty border flower named from the form of the blue corolla, which resembles a little, round, concave mirror (speculum). Aug. Ann. *Venus' Looking-glass.*

Several other foreign species of this genus are beautiful objects in cultivation, as *C. lanuginosa*, with ovate, crenate, rugose and somewhat woolly leaves, tapering into the petiole; flowers blue, an inch long. *C. lilifolia*, with lanceolate leaves and pale blue flowers. *C. glomerata*, with crowded, sessile violet-colored flowers. *C. persicifolia*, peach-leaved, with broad, blue flowers; &c.

ORDER LXXIX. ERICACEÆ. *The Heath Tribe.*

Cal.—Inferior or superior, 5 (seldom 4—6-)leaved or cleft, rarely entire.
Cor.—Regular or somewhat irregular, 4—5 (rarely 6-) cleft, the petals rarely almost distinct.
Sta.—Generally distinct and inserted with the corolla.
Anth.—As many or twice as many as the lobes of the corolla, 2-celled, generally opening by pores, often appendaged.
Ova.—Free or rarely coherent with the calyx, 2—several-celled.
Styles and *stigmas* united into one.
Fr.—Capsular or baccate, with (usually) indefinite and minute seeds.

A moderately large family, consisting of shrubs with a few herbs. It is diffused throughout all countries, but comparatively rare in the torrid zone. The true Ericaceæ (Heaths) are chiefly native of the Cape of Good Hope, there being none in Asia, New-Holland or America. The Tribe vaccineæ are chiefly natives of N. America.

Properties. The Ericaceæ are, in general, astringent and diuretic. Some of them yield a stimulating and aromatic resinous matter. The Bearberry, (Arctostaphylos uvo-ursi) is a well known remedy in nephritic complaints. An infusion of the leaves is astringent, demulcent and diuretic. Similar properties are also possessed by the Pipsissewa (Pyrola umbellata). The species of Rhododendron and Kalmia are pervaded by a narcotic principle, rendering them (particularly their leaves) often actively poisonous. The honey collected from their flowers by bees appears to have been so to some of the soldiers in the retreat of the immortal ten thousand (Xenophon's Anabasis.) The berries of the Vaccineæ (Whortleberries, Blueberries and Cranberries,) and of Gauetheria procumbens (spicy Wintergreen) are esculent and wholesome.

Conspectus of the Genera.

Lvs. verdant.	Cal. free from ovary.	Pet. sub-distinct.	Caps. 4 or 5-celled.	Leaves cauline, smooth.	Flowers regular.	*Chimaphila.* 13
					Flowers irregular.	Rhodora. 8
				rusty downy beneath.		*Ledum.* 9
				Leaves radical, evergreen.		*Pyrola.* 12
			Capsule 3-celled. Leaves deciduous, smooth.			*Clethra.* 6
		Petals united...	Corolla ovoid....	Calyx glandular.		*Menziesia.* 2
				Calyx smooth.	Fruit a capsule..	*Andromeda.* 1
					Drupe the matured ovary, 5-seeded.	*Arctostaphylos.* 3
					Berry the matured, fleshy calyx.	*Gaultheria.* 4
			Corolla salver-form,	holding the anthers in 10 pits.		*Kalmia.* 7
				anthers free. Calyx calyculate.		*Epigæa.* 5
			Corolla somewhat funnel-shaped or campanulate.			*Rhododendron.* 8
	Calyx adherent to the ovary.....			Corolla ovoid-campanulate.		*Vaccinium.* 10
				Cor. rotate, with reflexed seg.		*Oxycoceus.* 11
Plants destitute of leaves or verdure.				Petals distinct. . . .		*Monotropa.* 14
				Petals united. . . .		*Pterospora.* 15

SUBORDER 1. ERICINEÆ.

Ovary free from the calyx. Testa conformed to the nucleus of the seed. Mostly shrubs. Leaves often evergreen.

1. ANDRO′MEDA.

Calyx minute, 5-parted, persistent; corolla ovoid-cylindric; the limb 5-cleft, reflexed; stamens 8—10; capsule 5-celled, 5-valved, the dissipiments produced from the middle of the valves.

Named for the virgin Andromeda, of ancient fable, who, like these shrubs, was confined in a marsh and surrounded by the monsters of the waters. Leaves mostly alternate. Cal. colored, of 5 deep, acute segments. Cor. smooth. Fil. shorter than the corolla. Anth. 2-horned at the summit and opening by 2 terminal pores. Caps. roundish, 5-cornered, many-seeded.

* Leaves evergreen.

1. A. HYPNOI′DES.

Stems filiform, spreading; *leaves* subulate, smooth, crowded; *peduncles* solitary, terminal; *corolla* globose, campanulate. One of the smallest and most delicate of shrubs, a tree in miniature, resembling some of the mosses, found on the alpine summits of the White Mts. Stems woody, much

branched at base, 2—3 inches high. Leaves minute, evergreen, spirally arranged, and so closely as to conceal the stems. Flowers small, but large in proportion, nodding; peduncles colored, smooth, round, an inch long in fruit. Calyx purple. Corolla light red, twice as long as the calyx, lobes erect. Stamens included. June. *Mossy Andromeda.*

2. A. POLYFO'LIA.

Leaves linear-lanceolate, coriaceous, revolute on the margins, glaucous beneath; *flowers* subglobose, in a dense, terminal *corymb.* A beautiful evergreen shrub, 1—2 feet high, growing by the side of ponds, and in swamps. Leaves very smooth, 2—3 inches long and less than half an inch wide, on very short petioles, dark green and smooth above, bluish white beneath. Flowers in pendulous clusters. Calyx white, tipped with red. Corolla rose-colored. June. *Wild Rosemary. Marsh Andromeda.*

3. A. CALYCULA'TA.

Leaves oval-oblong, obtuse, obsoletely serrulate, subrevolute, ferruginous beneath; *racemes* terminal, leafy, subsecund. An evergreen shrub, 2—4 feet high, flowering early, in wet situations. The leaves are coriaceous, shining, dotted, about an inch long and half as wide, those of the racemes not half as large. Flowers numerous, 20—30 in each raceme, white, each from the axle of a small leaf. Calyx double, the outer of 2 bracts, the inner of 5 acute sepals. April. May. *Dwarf Andromeda.*

* * Leaves deciduous.

4. A. RACEMO'SA.

Leaves oval-lanceolate, acute, glabrous, serrulate; *racemes* terminal, secund elongated, sometimes branched; *calyx* acute; *corolla* cylindric; *anthers* 4-awned at the summit. A shrub 4—6 feet high, growing in wet woods. It is remarkable for its naked racemes, 2—4 inches in length, consisting of about a dozen flowers, which are arranged in a single row, with much regularity. Leaves 1—2 inches in length, one third as wide, minutely notched. Pedicels short, with two ovate-acuminate bracts at the base of the colored calyx. Corolla white, 4 or 5 times as long as the calyx. Anthers 2-cleft, about half as long as the corolla. June. July. *Clustered Andromeda.*

5. A. LIGUSTRI'NA. *Muh.* Lyonia paniculata. *Nutt.*

Pubescent; *leaves* obovate-lanceolate, acuminate, finely serrulate; *flowers* somewhat paniculate, in terminal, leafless racemes; *anthers* awnless. A deciduous shrub, 4—8 feet high, in swamps, &c. Leaves abruptly acuminate, paler beneath, 2—3 inches long and nearly half as wide, on short petioles. Flowers small, nearly globose, white, in dense panicles, succeeded by globular capsules. June. *Panicled Andromeda.*

2. MENZIE'SIA.

Calyx deeply 5-cleft; corolla ovoid 4—5-cleft; stamens 8—10, inserted into the receptacle; capsule 4—5-celled, the dessipiments made by the inflexed margins of the valves; seeds many.

Named in honor of Archibald Menzies, botanist and physician, who accompanied Vancouver in his voyage round the world. Little heath-like, shrubby plants, with evergreen leaves. Cal. inferior. Cor. inflated, limb in 4 or 5 segments. Fil. shorter than corolla. Style angular, erect. Stig. obtuse, notched.

M. CŒRU'LEA. Erica Cœrulea.

Stems prostrate at base; *leaves* linear, obtuse, with minute cartilaginous teeth; *peduncles* terminal, aggregate, one-flowered; *flowers* campanulate, decandrous; *calyx* acute. A small shrub, a few inches high, found on the summit of the White Mts. It resembles a Heath in its flowers and some of the fir tribe in its leaves and stems. Stem decumbent at base, with crowded, scattered leaves above, which are 5—7 lines in length. Flowers drooping, purple, at the top of the highest branch, on colored peduncles. Calyx in 5 segments, purplish. Corolla of 5 segments, emarginate, rather longer than the stamens. July. *Mountain Heath.*

3. ARCTOSTA'PHYLOS.

Calyx 5-parted, persistent; corolla ovoid, diaphanous at the base, limb with 5 small, recurved segments; drupe with a 5-celled putamen, the cells 1-seeded.

Gr. αρκτος, a bear, σταφυλος, a cluster of grapes, that is, bear-berry. Trailing shrubs. Lvs. alternate. Cal. small. Seg. obtuse. Fil. swelling at the base, half the length of the corolla. Anth. with two distinct cells, each with a terminal pore. Connectile with two terminal awns. Ova. superior, upon a 10-dotted receptacle. Style as long as corolla.

A. UVA URSI. *Adans.* Arbutus Uva Ursi. *L.*

Stem procumbent; *leaves* entire, obovate, smooth, alternate, on short petioles, evergreen, coriaceous, shining above, paler beneath; *flowers* in short, terminal, drooping clusters; *drupe* globular, about as large as a currant, deep red, nearly insipid; the nucleus consists of 5 bony seeds firmly united together. A shrub growing on mountains, in the N. States and British America. Stem prostrate except the younger branches, which arise 3—8 inches. The leaves are about an inch in length, 2—3 lines wide, often spathulate in form; medicinally they are astringent, and much valued in nephritic complaints. May. June. *Bear-berry.*

4. GAULTHE'RIA.

Calyx 5-cleft with 2 bracts at the base; corolla ovoid-tubular, limb with 5 small, revolute lobes; filaments 10, hirsute; capsule 5-celled, invested by the calyx which becomes a berry.

Named for one Gaulthier, a French physician at Quebec. Suffruticose, evergreen. Lvs. alternate. Fls. solitary. Limb of corolla small, 5-cleft. Seg. reflexed. Fil. hairy. Nect. 10-toothed. Berry scarlet.

1. G. PROCU'MBENS.

Stem with the procumbent branches erect or ascending; *leaves* obovate, mucronate, denticulate, crowded at the top of the stem; *flowers* few, drooping, terminal. A little shrubby plant, well known for its spicy leaves and its well-flavored scarlet berries. The branches ascend 3 inches from the prostrate stem, or rhizoma, which is usually concealed. Leaves evergreen, thick, shining, acute at each end, with remote and very obscure teeth. Calyx white, subtended by 2 minute bracts at base. Corolla white, contracted at the mouth. Filaments white, bent towards the corolla. Fruit well-flavored, consisting of the capsule surrounded by the enlarged calyx, which becomes of a bright scarlet color. Woods and pastures. June—Sept. *Checkerberry.*

2. G. HISPI'DULA. *Muh.* Vaccinium hispidulum. *Mx.*

Stem creeping, hispid; *leaves* roundish-oval, acute; *flowers* solitary, axillary, subsessile, octandrous; *corolla* short, campanulate. A delicate evergreen, prostrate shrub, found in old woods in many parts of N. England. The stems are woody, filiform, creeping extensively, with numerous branches, and clothed with short, appressed, reddish hairs. Leaves numerous, alternate, ¼—½ inch long and nearly as wide, abruptly acute, dark evergreen above, paler beneath. Corolla white, and, like the calyx, with 4 acute segments. The leaves have the same agreeable spicy flavor as those of *G. procumbens.* Flowers in May. *Creeping Wintergreen.*

5. EPIGÆ'A.

Calyx large, 5-parted, with 3 bracts at base; corolla hypocrateriform, tube villous within, limb 5-parted, spreading; stamens 10; anthers dehiscent by 2 longitudinal openings; capsule 5-celled, 5-valved.

Gr. επι, upon, and γη, the earth; from its prostrate habit. Suffruticose, trailing. Lvs. alternate, evergreen. Fls. fasciculate. Fil. hairy, inserted into the base of the tube. Style straight. Stig. 5-lobed. Caps. with dissepiments formed by the introflexed margin of the valves.

E. REPENS.

Leaves cordate-ovate, entire; *corolla tube* cylindrical. This little shrubby plant grows flat upon the ground, 10—15 inches in length, covered with a hairy pubescence in all its parts. Leaves alternate, 2—2½ inches in length, 1½ inches in width, roundish at the end and abruptly tipped with a very short point. Flowers very fragrant, white or tinged with various shades of red, in small clusters on short stalks. Calyx green, supported by 3 large bracts at base. Tube of the corolla hairy within, longer than the calyx, the border in 5, rounded, spreading segments. Grows in woods, Apr. May. Per. *Trailing Arbutus. May Flower.*

6. CLETHRA.

Calyx 5-parted, persistent; petals 5; stamens 10, exserted; style persistent; stigma 3-cleft; capsule 3-celled, 3-valved, enclosed by the calyx.

A name given by the Greeks to the alder, which these shrubs somewhat resemble. Lvs. alternate, deciduous. Fls. racemose. Cal. colored, erect. Pet. roundish or oblong, twice the length of the calyx. Fil. length of corolla. Anth. cleft at top.

C. ALNIFO'LIA.

Leaves cuneiform-obovate, acute, acuminately serrate, green on both sides, smooth or slightly pubescent beneath; *flowers* in terminal, elongated, simple or branched racemes; *bracts* subulate. A deciduous shrub, 4—8 feet high, growing in swamps. Leaves 2—3 inches long, one half as broad above, with a long, wedge-shaped base, tapering into a short petiole. Racemes 3—5 inches long. Peduncles and calyx hoary-pubescent, the former 3 lines in length, and in the axil of a bract about as long. Corolla white, spreading, about equaling the stamens and styles. Jl. Aug. *Sweet-pepper Bush.*

7. KA'LMIA.

Calyx 5-parted; corolla with 10 prominences beneath and 10 corresponding cavities within, including the 10 anthers; border 5-lobed; capsule 5-celled, many-seeded.

Named by Linnaus in honor of Peter Kalm, prof. at Abo. Finland. A genus of beautiful shrubs, native of the U. States. Lvs. entire, evergreen, coriaceous. Fls. in racemose corymbs, white and red. Cor. between wheel-form and salver-form. Stam. curving outwards, the anthers confined in the 10 cavities until, at length, being liberated, they spring forcibly against the stigma.

1. K. LATIFO'LIA.

Leaves alternate and ternate, oval-lanceolate, acute at each end, smooth and green on both sides; *corymbs* terminal, viscidly pubescent. One of our most beautiful shrubs, sometimes attaining the hight of a small tree. It is found in all the Atlantic States from Maine to Georgia. The wood is usually very crooked, fine-grained and compact. The leaves are 2—3 inches long, smooth and shining, acute at each end and entire. In May and June it puts forth from the summits of the branches, its splendid corymbs of flowers, which are white, or variously tinged with red, and so abundant as sometimes almost to cover the whole bush. The corolla has a short tube with a spreading limb 3-4 inch in diameter and a 5-lobed margin. Grows in woods, often on rocky soils. Leaves narcotic, and poisonous to some animals. *Mountain Laurel.*

2. K. ANGUSTIFO'LIA.

Leaves ternate and opposite, elliptic-lanceolate, obtuse at each end, smooth; *corymbs* lateral; bracts linear-lanceolate. A beautiful little shrub, smaller than the foregoing, 2—4 feet in hight. The leaves are acurately and narrowly elliptic, with rounded ends, entire, smooth, 1—2 inches long and a third as wide, on short petioles. The flowers are of a deep purple, growing in small, axillary fascicles and apparently whorled among the leaves, in structure resembling those of the last species, but about half as large. Bracts minute, about 3 at the base of each pedicel. This is also said to be poisonous to cattle. Low, wet grounds. June. *Sheep-poison. Narrow-leaved Laurel.*

3. K. GLAUCA.

Branches ancipitous; *leaves* opposite, subsessile, lanceolate, polished, glaucous beneath, revolute at the margin; *corymbs* terminal, the peduncles and bracts smooth. A delicate shrub, 2 feet high, found in swamps, &c. Stem slender, the branches rendered distinctly 2-edged by an elevated ridge extending from the base of each opposite leaf to the next node below. Leaves smooth and shining, white underneath, about an inch in length. Flowers 8—10 in each corymb. Corolla about half an inch in diameter, pale purple. Calyx red, as is also the very slender peduncle. At the foot of each peduncle is a pair of concave, obtuse bracts. June. *Glaucous Kalmia. Swamp Laurel.*

β. rosmarinifolia; leaves linear, more revolute, green beneath.

8. RHODODE'NDRON.

Calyx 5-cleft; corolla somewhat funnel-form or campanulate, limb variously 5-cleft or lobed (rarely equal); stamens 5—10, declined, (rarely erect); anthers opening by 2 terminal pores; capsule 5-celled, 5-valved, opening at the summit.

Gr. ῥοδον, a rose, δενδρον, a tree; the species are all ornamental, and some even splendid flowering shrubs. Lvs. alternate, entire, deciduous or evergreen. Flowers mostly in terminal, corymbose clusters. Corollas variously shaded from white through red to blue. Caps. with dissepiments introflexed from the margin of the valves.

* Corolla very irregular, deeply 3-parted, upper segment broadest. Stamens 10, unequal. RHODORA.

1. R. CANADE'NSIS. *Torr.* Rhodora Canadense. *L.*

Leaves alternate, oval, entire, subrevolute on the margins, glaucous-pubescent beneath; *corolla* deeply divided into 3 segments, of which the upper one is much the broadest, 2 or 3 lobed at the end, in æstivation enfolding the 2 lower entire petals. A handsome flowering shrub, remarkable for the appearing of the flowers in May, before the leaves are expanded. Stems about 2 feet high, dividing at their tops into many erect, slender, flowering branches. Each branch, while yet naked of foliage, bears a terminal, corymbose cluster of half a dozen purple flowers. Corolla about an inch long. Stamens curved downwards, about equal to the corolla, rather shorter than the style. This plant corresponds with the Linnæan Rhododendron in all respects save the very irregular corolla; and even in this it is not essentially different.

* * Corolla somewhat funnel-form, tube long, cylindric, more or less viscid, limb unequal, spreading. Stamens 5 or 6. AZALEA.

2. R. NUDIFLO'RA. *Torr.* Azalea nudiflora. *L.*

Leaves oblong-lanceolate and oblanceolate; *flowers* rather naked, slightly viscid; *tube of the corolla* longer than the lobes; *stamens* much exserted. A beautiful and fragrant flowering shrub, 4—6 feet high, rather frequent in the forests and thickets of the Northern States as well as the Southern. Stems crooked, much branched above, the young branches hairy. Leaves elliptical, 2 inches or more in length, 1 in width, margins ciliate, upper surface with minute, scattered hairs, lower paler and pubescent, with the midrib hispid. Flowers appearing before the leaves are fully grown in rather naked umbels. Peduncles 6—8 lines long. Calyx minute, with rounded, ciliate segments. Tube of corolla 6—8 lines in length, hairy, and, with the spreading, unequal limb variously shaded from pale pink to purple. Stamens purple, declinate, twice as long as the corolla. Style nearly 3 times as long. It varies in the number of stamens, color of corolla, &c. Apr. May. *Swamp Pink.*

3. R. VISCO'SA. *Torr.* Azalea viscosa. *L.*

Leaves obovate and oblong-lanceolate; *flowers* accompanied with leaves, very viscid; *tube of the corolla* twice as long as the lobes; *stamens* a little exserted. Less frequent than the last, in rocky woods, &c. Shrub 4—6 feet high, much branched above, the branches hispid. Leaves 1—2 inches long and about half as wide, smoothish, hispid, ciliate on the petiole, midrib and margin. Flowers fragrant, in terminal umbels, on hairy pedicels, not appearing until the leaves are fully grown. Calyx minute and ciliate. Corolla white, tube an inch in length, clothed with glandular hairs, and very clammy, limb unequal. Stamens and style declined, the latter longest. May, June. *Clammy Swamp Pink.*

4. R. NI'TIDUM. *Torr.* Azalea nitidum. *L.*

Leaves oblanceolate, coriaceous, smooth both sides, shining above, margins revolute; *flowers* accompanied with leaves, viscid; *tube* much longer than the segments; *stamens* exserted. In mountain swamps, Ms. and N. Y. Shrub 3—6 feet high, with nearly smooth branches. Leaves dark green above, 1—2 inches in length and one third as wide, roundish and submucronate above, tapering at the base into very short petioles, midrib hispid beneath. Flowers

large, pale pink, fragrant. Tube an inch or more long, glandular-hairy. Pedicels half an inch long. Calyx segments obsolete. Style 2 inches in length. June, July. *Shining Swamp Pink.*

* * * Corolla somewhat funnel-form, tube short, smooth, limb in 5 rounded, unequal, spreading lobes. Stamens 10, declinate, unequal. RHODODENDRON.

5. R. MA'XIMUM.

Leaves obovate-oblong, smooth, coriaceous, discolored beneath, subrevolute on the margin; *umbel* terminal; *corolla* somewhat campanulate, unequal; *petals* roundish. A splendid flowering shrub, not uncommon in N. England, but most abundant in the Middle States. It is found in Medfield, Ms., Gilmanton, Grantham, Fitzwilliam, N. H., &c. It attains the hight of 20 feet. The young leaves are downy, becoming very smooth when full grown and 4—6 inches long, oblong-oval, rather broader above, entire, thick and leathery, permanent, remaining on the stem 2 or 3 years. In July it puts forth its noble clusters of flowers at the ends of the branches in the midst of the evergreen leaves. At first each cluster appears in the form of a large compound bud enveloped in numerous bracts. These bracts are near an inch long, abruptly acuminate. When expanded the corolla is pink or rose-colored, sometimes dotted with yellow, segments large, rounded. The wood is hard and fine grained, but crooked. July, Aug. *Wild Rose Bay. Spoon-wood.*

Several varieties occur in various parts of the United States. The dried and powdered leaves form a snuff which is much valued for catarrh.

* * * * Corolla campanulate, limb erect or spreading, equal. Stamens 5, equal, erect. AZALEA.

6. R. LAPPO'NICUM. *Wahl.* Azalea Lapponicum. *L.*

Dwarf; *leaves* elliptical, roughened with excavated punctures; *flowers* in terminal, leafy clusters, campanulate, limb spreading, 5-lobed; *stamens* 5, exserted. An erect shrub 8—10 inches high, native of the White Mts., &c. Branches numerous, with a rough bark. Leaves about 5 lines in length, one half as wide, acute with an obtuse angle, revolute, ferruginous beneath, all fasciculated at the summits of the branches. Flowers large. Peduncle bracted at base. Calyx pubescent. Corolla deep purple, regular, lobes roundish, as broad as the leaves. Style very long, ascending. June, July.

7. R. PROCU'MBENS. Azalea procumbens. *L.*

Stems procumbent, diffusely branching; *leaves* opposite, oval-oblong, smooth, revolute on the margin; *flowers* campanulate, regular; *stamens* included. An exceedingly delicate shrub, native on the alpine summits of the White Mts. of N. H. Stems 3—6 inches long, smooth, very branching and leafy above. Leaves evergreen, thick, obtuse, not more than 3 lines in length and less than 1 line wide, strongly revolute. Flowers glabrous, small in terminal clusters enveloped in leaves. Pedicels very short, purple. Calyx purple, the segments ovate-lanceolate. Corolla reddish white, 5-cleft, the divisions ovate, erect-spreading, as long again as the calyx. Stamens 5. Anthers opening by an oblong pore or cleft. Jn., Jl. *Trailing Rhododendron.*

9. LEDUM.

Calyx minute, 4-toothed; corolla 5-petaled, spreading; stamens 5—10, exserted; anthers opening by 2 terminal pores; capsule 5-celled, 5-valved, opening at the base.

The Lat. name of the same or a similar plant. Shrubs with alternate leaves. Fls. in terminal clusters. Caps. pedicellate. Sds. numerous, linear, compressed, scabrous, with a membranaceous wing at each end.

L. LATIFO'LIUM.

Leaves oblong, revolute at the margin, ferruginous-tomentose beneath; *stamens* mostly but 5, as long as the calyx. Grows on the White Mts. covering a large area; also on other high mountains, and in swamps. A shrub 2—3 feet high, readily known by its leaves, which are smooth above, clothed beneath with a dense ferruginous down, and strongly revolute or replicate at the margin. The petioles and the younger twigs are also covered with down. Leaves 1—2 inches long, nearly a third as wide. Corymbs terminal, of about a dozen flowers. Petals 5, white. Pedicels nearly as long as the leaves. Stamens 5—10, as long as the petals. Style somewhat declined. July. *Labrador Tea.*

β. palustre; leaves narrower, almost linear; *stamens* mostly 10. I have specimens of this variety which I cannot characterize as a distinct species.

SUBORDER 2. VACCINEÆ.

Ovary adherent to the tube of the calyx, becoming a berry or drupelike fruit. Shrubs with scattered leaves.

10. VACCI'NIUM.

Calyx superior, 4—5-toothed; corolla monopetalous, ovoid-campanulate, with 4—5 revolute segments; stamens 8—10, perigynous; berry globose, 4—5-celled, many-seeded.

A Lat. term of uncertain origin and application. A fine genus of undershrubs, with alternate, coriaceous, exstipulate leaves. Flowers racemose or solitary, nodding, flesh-colored. Berries mostly eatable.

* Leaves deciduous. † Corolla urceolate. ‡ Inflorescence racemose or fasciculate.

1. V. RESINO'SUM.

Leaves oblong-oval, mostly obtuse, petiolate, entire, sprinkled with resinous points and spots beneath; *racemes* bracteate, short, secund; *corollas* tubular, ovoid, 5-angled. This common shrub of our woods and pastures is about 2 feet high, very branching. Lvs. 1—2 inches long, one third as wide, rarely acute, shining beneath with resinous patches and spots. Petioles a line in length. Flowers in lateral, dense, corymbose clusters, small, drooping. Pedicels as long as the corollas. Corollas contracted at the mouth, greenish or yellowish purple, longer than the stamens but shorter than the style. Berries black, globose, sweet and eatable, ripe in August. May. *Black Whortleberry.*

2. V. CORYMBO'SUM. *L.* V. fuscatum. *Ait.* V. dismorphum. *Mx.*

Flowering branches nearly leafless; *leaves* oblong-oval, acute at each end, mucronate, subentire, pubescent when young; *racemes* short, sessile; *corolla* ovoid-cylindrical. A tall shrub, 4—8 feet high, growing in shady swamps and by mud ponds. Branches few, the young ones green or purplish. Leaves smooth on both sides except a slight pubescence on the veins beneath, tipped with a glandular point, formed by the prolonged midrib. Flowers numerous, in short, nodding corymbose clusters, appearing in advance of the leaves. Pedicels shorter than the corollas, with colored scales or bracts at base. Corolla large for the genus, purplish-white, slightly contracted at the mouth. Stamens included. Style often exserted. Berries large, black, often with a tinge of purple, subacid. June. *High Whortleberry.*

3. V. PENNSYLVA'NICUM. *Lam.* V. tenellum. *A.*

Leaves subsessile, ovate-lanceolate, mucronate, often serrulate; *racemes* fasciculate, bracteate, subterminal, sessile; *corolla* ovoid; *branches* angular, green. The common blue-berry is abundant in dry, hilly pastures, and on high mountains, covering extensive patches. Stems seldom more than a foot high, very branching and leafy. Leaves shining, thin, smooth, an inch or more in length and half as wide. Flowers numerous, in terminal and lateral racemes, often naked. Pedicels shorter than the corolla. Corolla reddish white, contracted at the mouth, longer than the stamens but equaling or shorter than the style. Berries large, blue and somewhat glaucous, sweet and nutricious. May, June. *Low Blue-berry.*

* Leaves deciduous. † Corolla urceolate. ‡‡ Inflorescence solitary.

4. V. ULIGINO'SUM. *L.* V. uliginosum, *β.* alpinum. *Bw.*

Procumbent; *leaves* obovate, very obtuse, entire, smooth, glaucous and veiny beneath; *flowers* mostly solitary, axillary; *corolla* ovoid-globose, 4-cleft; *stamens* 4; *anthers* awned at the base. A low, alpine shrub. White Mts. Stems with numerous, rigid branches. Leaves 3 lines long, 2 lines wide near the apex, scarcely petiolate, crowded near the ends of the branches and of a bluish green. Flowers half as long as the leaves, subsessile, sometimes 2 together. Berries oblong, deep blue, crowned with the style. June, July. (April, May. *Beck.*) *Mountain Blue-berry.*

* Leaves deciduous. † † Corolla campanulate.

5. V. STAMI'NEUM. *L.* V. stamineum & album. *P.*

Young branches pubescent; *leaves* oval-lanceolate, acute, glaucous beneath; *pedicels* solitary, axillary, nodding; *corolla* campanulate-spreading, segments acute, oblong; *anthers* exserted, 2-awned near the base. Dry woods. Shrub 2—3 feet high, very branching. Leaves 1—2 inches long, one fourth to one half as wide, broadest in the upper half, mostly rounded at base and on very short petioles; those on the slender flowering-branches very much smaller. Flowers on long, slender pedicels, arranged in loose, leafy racemes. Corolla white, spreading, stamens conspicuously exserted, but shorter than the style. Berries large, greenish white, bitter. May, June. *Deer-berry.*

6. V. FRONDO'SUM. *L.* V. glaucum. *Mx.*

Leaves oblong-obovate, obtuse, entire, glaucous beneath, covered with minute, resinous dots; *racemes* loose, bracteate; *pedicels* filiform, bracteate near the middle; *corolla* ovoid-campanulate, including the stamens. Grows in open woods. A shrub 3—5 feet high, with round, smooth and slender branches. Leaves twice as long as wide, tapering to each end but broadest in the upper half, the margin slightly revolute. Racemes lateral, few-flowered. Pedicels 5—10 lines in length. Flowers small, nearly globose, reddish white, succeeded by large, globose, blue and sweet berries, covered with a glaucous bloom when mature. May, June. *High Blue-berry.*

** Leaves evergreen.

7. V. VITIS-IDÆ'A.

Stem creeping; *leaves* obovate, denticulate, revolute, dotted underneath, sessile; *racemes* terminal, nodding. A low, creeping, evergreen shrub, with erect, angular branches. Leaves coriaceous and shining, dark green above, pale beneath, 1-2 inch in length, rounded at the apex, and tapering to the base. Flowers small, nearly sessile. Corolla pale red, oblong-campanulate, 4-cleft, including the 8 stamens. Berries deep red, very acid and astringent. Grows near the notch of the White Mts. June, July. *Cow-berry.*

11. OXYCO'CCUS.

Calyx superior, 4-cleft; corolla 4-parted, with sub-linear, revolute segments; stamens 8, convergent; anthers tubular 2-parted; berry globose, many-seeded.

Gr. ὀξυς, acid, and κοκκος, fruit. Slender prostrate shrubs, with alternate, coriaceous, exstipulate leaves and eatable berries. Cal. very small, permanent. Cor. almost wholly rolled back to the base.

1. O. MACROCA'RPUS.

Stem creeping, filiform; *leaves* oblong, scarcely revolute, obtuse, glaucous beneath; *pedicels* axillary, elongated, 1-flowered; *segments of the corolla* linear-lanceolate. A prostrate, shrubby plant, in sphagnous swamps and meadows. Stems 8—15 inches in length, brown, with ascending branches. Leaves numerous, 3—4 lines long, 1—2 lines wide, rounded at each end, on very short petioles, smooth both sides, subentire. Flowers flesh-colored, pedicels 5—15 lines long, solitary, in the axils of the upper leaves, the 4 segments generally abruptly reflexed. Berry large, bright scarlet, ripe in Oct. Flowers in June. *Large-fruited Cranberry.*

2. O. VULGA'RIS.

Stem filiform, prostrate; *leaves* ovate, entire, revolute on the margin; *pedicels* terminal, 1-flowered; *segments of the corolla* ovate. A prostrate shrub, found in alpine bogs, very distinct from the last species. Stems creeping extensively, smooth, purple, with erect branches. Leaves somewhat remote, 2—3 lines long and half as wide, smooth and shining above, paler beneath. Flowers several together on the summits of the branches. Pedicels red, an inch in length, with 2 nearly opposite bracts in the middle. Corollas light-pink, the 4 segments abruptly reflexed. Stamens purple. Fruit smaller than in the former species, crimson, ripe in Oct. Flowers in June.

SUBORDER 3. PYROLEÆ.

Ovary free from the calyx. Petals nearly distinct. Fruit a capsule. Mostly herbaceous.

12. PY'ROLA.

Calyx small, of 5 deep segments; petals 5, equal; stamens 10; anthers large, pendulous, fixed by the apex; capsule 5-celled, opening at the angles, many-seeded.

Pyrola is the Latin diminutive of *Pyrus*, the Pear-tree, which this genus often resembles in respect to the leaves. Low, scarcely suffruticose, evergreen herbs. Lvs. radical or nearly so, entire. Scape mostly racemose. Pet. roundish, spreading. Fil. shorter than cor. Anth. 2-horned, opening by 2 pores at the summit. Style longer than stem, straight or declinate. Seeds numerous, arillate.

* Stamens ascending. Style declinate, longer than the petals.

1. P. ROTUNDIFO'LIA.

Leaves orbicular-ovate, entire or crenulate, shorter than the dilated petiole; *scape* 3-angled; *segments of the calyx* lanceolate, acute; *stigma* clavate, obscurely 5-toothed. Common in woods. Leaves all radical, round or inclining to ovate, nearly 2 inches in diameter, smooth and shining, with conspicuous, reticulate veins. Petioles margined, as long as, and sometimes much longer than, the leaf. Scape 6—12 inches high, bracteate at base and in the middle. Flowers drooping, large, fragrant, in an oblong, terminal raceme.

Pedicels as long as the bracts at base. Petals white, variously tinged with red, longer than the stamens. June. *Round-leaved Pyrola. Shin-leaf.*

2. P. ASARIFO'LIA.

Leaves reniform-orbicular, coriaceous, entire or crenulate, shorter than the dilated petiole; *scape* angular, furrowed; *raceme* lax, many-flowered; *segments of the calyx* ovate, acute, appressed; *stigma* clavate, with the disk elongated and 5-lobed. In old woods. Leaves all radical, 12—18 lines in diameter, coriaceous, smooth and shining, conspicuously cordate at base, longer than, but not twice as long as, the margined petioles. Scape 5—10 inches high, purplish, bracteate at base and near the middle, racemose one half its length. Flowers nodding, remote, large, deeply tinged with purple in all their parts. Pedicels half an inch long, equaling the bracts at base. Style of about the same length and curvature as pedicel, but thicker, tipped with 5 elongated teeth. June. Very distinct from P. rotundifolia, or any other species. *Asarum-leaved Pyrola.*

3. P. CHLORA'NTHA. *Swartz.* P. rotundifolia. *Muh., &c.*

Leaves orbicular, crenulate, half as long as the narrow petiole; *raceme* few-flowered; *segments of the calyx* very short, obtuse; *petals* oblong; *pores of the anthers* tubular; *stigmas* clavate, with the disk elongated, and 5-lobed. In woods, common. Leaves smaller than in either of the preceding species, often perfectly orbicular, but more frequently inclining to ovate, one half to one inch in diameter, smooth, shining coriaceous. Petioles 1—2 inches long. Scapes erect, angular, 8—12 inches high, bearing a long, open raceme. Flowers nodding, large, remote, pedicels half an inch long, each in the axil of a very short bract. Petals greenish white. Anther tubes conspicuous. June, July. *Green-flowered Pyrola.*

4. P. ELLI'PTICA.

Leaves elliptical, membranaceous, obscurely dentate, longer than the petioles; *scape* mostly naked; *calyx* small, with ovate, obtuse segments; *pores of the anthers* short, tubular. In woods. Leaves 1—2 inches long, more than half as wide, mostly acute and subentire, thin, smooth and light green. Scape 5—9 inches high, slender, seldom bracteate, bearing short racemes. Flowers nodding, very fragrant. Pedicels longer than the bracts, but only half as long as the declinate, recurved style. Petals white. July. *Pear-leaved Pyrola.*

* * Stamens erect. Style straight.

5. P. SECU'NDA.

Style straight; *leaves* ovate, acute, subserrate, longer than the petiole; *raceme* secund. In dry woods. Stem 2—3 inches high, bearing one or two fascicles of leaves near the summit. Leaves broadly ovate, acute at each end, with appressed, pointed, serratures. Petioles an inch long. Peduncles scape-like, 5—7 inches high, bearing a 1-sided cluster of 10—15 greenish white flowers. Petals oblong, shorter than the style. Jn. Jl. *One-sided Pyrola.*

6. P. UNIFLO'RA.

Leaves suborbicular, petiolate, smooth, serrate; *scape* 1-flowered; *style* straight. Woods, in Keene, N. H., according to Dr. Bigelow, but I have sought it there in vain. Scape but 2—3 inches high, erect, bearing a single, large, white, fragrant flower. Anthers with the pores elongated-tubular. Style short, stigma peltate. June. Per. *One-flowered Pyrola.*

13. CHIMA'PHILA.

Calyx 5-parted; petals 5; stamens 10, erect; anthers fixed by the middle; style very short and thick; capsule 5-celled, opening from the summit.

Gr. χειμα, winter, and φιλεω, to love; equivalent to the English name, *Wintergreen*. Small, suffruticose plants, resembling Pyrola in habit. Stems branching. Lvs. cauline, serrate, evergreen, opposite or somewhat verticillate. Fls. terminal. Fil. bearing a roundish, hairy disk in the middle. Anth. 2-beaked, and opening by 2 pores at base.

1. C. UMBELLA'TA. *P.* Pyrola umbellata. *L.*

Leaves cuneate-lanceolate, serrate, in 4s—6s; *flowers* corymbose; *bracts* linear-subulate; *style* immersed in the ovary. In dry woods, flowering in July. A common and beautiful evergreen. Leaves in 2 or more irregular whorls, 2—3 inches long and one fourth as wide, remotely and distinctly serrate, on short petioles, coriaceous, shining, of a uniform dark green color. Peduncle terminal, erect, 3—4 inches long, bearing 4—7 light purple flowers on nodding pedicels 8 lines long. Both this and the following species are tonic and diuretic. *Bic.* July. Per. *Prince's Pine.*

2. C. MACULA'TA. *P.* Pyrola maculata. *L.*

Leaves lanceolate, acuminate, rounded at the base, remotely serrate, discolored, opposite or in 3s; *peduncles* corymbose, 2—3-flowered; *filaments* woolly. Habits much like the last, but it is readily distinguished by its variegated leaves. Stem 3—4 inches high. Leaves 1—2 inches long and one third as wide, marked with a whitish line along the midrib and nerves. Flowers purplish white, on nodding pedicels. June, July. *Spotted Wintergreen.*

SUBORDER 4. MONOTROPEÆ.

Ovary free from the calyx. Leafless herbs, destitute of verdure.

14. MONO'TROPA.

Calyx 4—5-sepaled, gibbous at base; corolla 4—5-petaled or 0; stamens 8—10; stigma peltate; capsule 5-celled, many-seeded.

Gr. μονος, one, and, τρεπω, to turn; because the flowers of some species are all turned one way. Leafless herbs, without verdure, of a pale, uniform hue. Scape scaly, racemose or 1-flowered. Perianth inferior, regular, oblong, deciduous. Style thick, as long as, or longer than the stamens.

1. M. UNIFLO'RA.

Scape erect, straight, 1-flowered; *flowers* decandrous, erect or cernuous. A small, succulent plant, about 6 inches high, yellowish white in all its parts Stem furnished with sessile, lanceolate, semi-transparent leaves, or bracts, and bearing a large, terminal, solitary flower. Common in woods, near the base of trees, on whose roots it is said to be parasitic. Jn. *Indian pipe. Bird's-nest.*

2. M. LANUGINO'SA. *Mx.* Hypopithys lanuginosa. *Nutt.*

Scape erect, pubescent above, bearing a raceme of woolly flowers; *bracts* woolly. The whole plant is of a tawny white, similar to the last. The root is a tangled mass of fibres. Scape 6—10 inches high, with many concave scales, covered with down. Flowers 7—12, in a terminal raceme, yellowish, drooping at first, becoming erect. Pedicels 1—2 lines long, bracts and flowers

3 times as long. Only the terminal flower is generally decandrous; the lateral ones have 8 stamens and 4 petals. Woods. Aug. *Pine Sap.*

15. PTERO'SPORA.

Calyx 5-parted; corolla roundish-ovoid, the limb 5-toothed and reflexed; stamens 10; anthers peltate, 2-celled, 2-awned; capsule 5-celled, 5-valved; seeds very numerous, minute, winged at the apex.

Gr. πτερος, a wing, σπορα, a seed; alluding to the winged seeds. A perennial? leafless herb. Fls. racemed. Cor. monopetalous. Caps. subglobose, valves with dissepiments from the middle. Recep. 5-lobed.

P. ANDRO'MEDA. *Nutt.* Monotropa procera. *Eaton.*

Tall, erect, leafless, found in various localities in N. Y. in clayey soil, rare. Scape 12—30 inches high, dark purple, clothed with short, viscid wool. Raceme 6—12 inches long, with 50 or more nodding flowers. Pedicels irregularly scattered, 6—8 lines long, axillary to long, linear bracts. Corolla shorter than the pedicels, somewhat campanulate, open at the throat, white, tipped with red at the summit. July. (Ann. *Nutt.* Per. *Torr.*)
Albany Beech-drops.

ORDER LXXX. AQUIFOLIACEÆ. *The Holly Tribe.*

Cal.—Sepals 4—6, imbricate in æstivation.
Cor.—Regular, 4—6-cleft or parted, hypogynous, imbricate in æstivation.
Sta.—Inserted into the tube of the corolla and alternate with its segments. *Anth.* adnate.
Ova.—Free from the calyx, 2—6-celled, with a solitary suspended ovule in each cell.
Fr.—Drupaceous, with 2—6 stones or nucules. *Albumen* large, fleshy.

A small order of trees and shrubs. Leaves alternate or opposite, commonly coriaceous. Flowers small, axillary. The species are natives of America and S. Africa, one only, Ilex (the Holly), being found in Europe.

Properties. The bark and leaves of Prinos verticillatus (black alder) are eminently astringent and tonic, as well as those of the holly. The berries are emetic and purgative. The leaves of Prinos glaber, and Ilex Paraguensis are used for tea.

Conspectus of the Genera.

Leaves	unarmed.	Petals united, mostly hexamerous.	*Prinos.*	3
		Petals distinct, mostly pentamerous.	*Nemopanthes.*	2
	spinose, evergreen, coriaceous.		*Ilex.*	1

1. ILEX.

Calyx 4—5-toothed, persistent; corolla subrotate, 4—5-parted; stamens 4—5; stigmas 4—5, subsessile, united or distinct; berry 4—5-seeded.

The ancient Latin name of the Holm Oak, the derivation uncertain. A genus of handsome shrubs and trees. Leaves mostly alternate, evergreen and spinose-toothed. Flowers often diœcious by abortion.

I. OPA'CA.

Leaves evergreen, oval, acute at end, with strong, spinous teeth, coriaceous, smooth and shining; fascicles of *flowers* lax, peduncles compound; *calyx* teeth acute; *fruit* ovate; *flowers* small, greenish white. A tree of middle size, quite generally diffused throughout the U. S. but no where very abundant. It is chiefly interesting for its foliage, which is of an exceedingly rich,

shining, perennial green. The flowers appear in June, in scattered clusters at the base of the older branches, and the fertile ones are succeeded by red berries which remain until late in autumn. The wood is fine grained and compact, useful in turnery, &c. *American Holly.*

2. NEMOPA'NTHES.

Calyx minute; petals 5, distinct, linear oblong; stamens 5; ovary hemispherical; stigmas 3—4, sessile; fruit a 3—4-celled, subglobose berry.

Gr. νεμος, a grove, παντος (genitive of πας) all; that is, a native of all groves, common; a character not strictly applicable to this rather rare shrub in the Northern States. Leaves alternate, deciduous, entire. Flowers mostly diœcious-polygamous by abortion.

N. CANADE'NSIS. *Raf.* Ilex Canadensis *Mx.*

Leaves deciduous, oval, very entire, smooth, mucronate-pointed peduncles nearly solitary, very long; *fruit* somewhat 4-sided. A shrub, 4—6 feet high, with smooth branches, growing in damp or rocky woods. Leaves oval or ovate-oblong, about 2 inches long, on petioles one third as long. The flowers, growing on long, slender, axillary peduncles which are seldom divided, are small, greenish white. Segments of the corolla acute, long as the stamens. Ovary of the barren flowers pointed, of the fertile with a 4-lobed stigma. Berries dry, red. May, June.

3. PRINOS.

Heads often diœcious or polygamous; calyx mostly 6-cleft; corolla 6-parted, rotate; stamens 4—6, berry 6-seeded.

Prinos was the Gr. name of the evergreen Oak. Cor. rotate, limb divided into 4—6 oval seg. Sta. shorter than cor. Berry roundish, much larger than the cal. Seeds bony, convex on one side, angular on the other. Shrubs.

1. P. VERTICILLA'TUS.

Leaves deciduous, oval, serrate, acuminate, pubescent beneath; *flowers* axillary, the fertile ones aggregate, the barren subumbellate. This shrub is found in moist woods or swamps, usually growing about 8 feet high. Leaves narrowed at base into a short petiole, uncinately serrate, with prominent, pubescent veins beneath. Flowers white, diœcious, small, in imperfect umbels or heads, sometimes monœcious. Berries scarlet, in little bunches (apparently verticillate), roundish, 6-celled and 6-seeded, permanent. July. *Winter Berry. Black Alder.*

2. P. GLABER.

Leaves evergreen, coriaceous, cuneate-lanceolate, glabrous, shining, serrate at the end. A shrub 3—4 feet high, found in swamps, with alternate, very smooth, leathery, shining leaves, and axillary white-petaled flowers, appearing in June and July. Pedicels subsolitary, mostly 3-flowered. Berries roundish, black and shining. *Ink Berry.*

3. P. AMBI'GUUS.

Leaves deciduous, oval, entire, acuminate at both ends; parts of the *flower* in 4s, the sterile ones crowded; the fertile, solitary. A shrub or small tree, 8—15 feet high, in wet grounds. Bark whitish, smooth. Leaves elliptical-oval, mucronate-pointed, petiolate, subpubescent beneath, 1—2 inches long and half as wide. Flowers polygamous, 4—5-cleft, the fertile ones on long peduncles. June. *Long-leaved Winter Berry.*

ORDER LXXXI. EBENACEÆ. *The Ebony Tribe.*

Fls.—Polygamous or diœcious (rarely perfect).
Cal.—Inferior, 3—6-cleft, divisions nearly equal, persistent.
Cor.—Regular, 3—6-cleft, often pubescent, imbricate in æstivation.
Sta.—Twice or four times as many as the lobes of the corolla.
Ova.—With 3 or more cells. *Style* with as many divisions.
Fr.—A fleshy, oval or globose berry.

Trees and shrubs, without a milky juice. Leaves alternate, without stipules, mostly entire and coriaceous. The species are mostly natives of the Indies and the tropics, one only being found as far north as New York.

Properties. Diospyrus is remarkable for the hardness and dark color of the wood. Ebony is the wood of D. Ebenus, Ebenaster, and other species, natives of Africa. The fruit of the species below is eatable when fully ripe, although extremely bitter and astringent before maturity. The bark is eminently febrifugal and astringent. *Storax* and *benzoin*, gum-resins of the shops, composed of resin and *benzoic acid*, are the products of two species of Styrax.

DIOSPY'ROS.

Perfect fl.—Calyx 4-cleft; corolla urceolate, 4-cleft; stamens 8 often 16; style 4-cleft; berry 8—12-seeded. *Sterile fl.*—Calyx and corolla 4-cleft; stamens 8—16; ovary abortive; style 0.

Gr. Διος πυρος, the fruit of Jove. The fruit hardly deserves so elevated a title, although excellent.

D. VIRGINIA'NA.

Leaves ovate-oblong, acuminate, entire, smooth, reticulate-veined; *petioles* pubescent; *buds* smooth. In woods of the Northern and Middle States, as well as of the South. With us it is a shrub or small tree, but grows to large dimensions at the South. Leaves 3—5 inches in length, entire, glaucous beneath. Flowers obscure, pale, greenish yellow, the fertile ones succeeded by a round, orange-red fruit as large as the garden plum, and containing 6—8 stony seeds. They are rendered sweet and palatable by the frost, although very austere when green. The bark is tonic and astringent. June. *Persimmon.*

ORDER LXXXIII. BEGONIACEÆ.* *The Begonia Tribe.*

Fls.—Monœcious or diœcious. [fls. 3—5, imbricated, 1—2 smaller than the others.
Cal.—Sepals superior, colored; in the sterile fls. 4, 2 interior and smaller; in the fertile
Sta.—Indefinite, distinct or combined. *Anth.* collected into a head, 2-celled.
Ova.—Adherent, winged, 3-celled. *Stigmas* 3, 2-lobed, somewhat spiral.
Fr.—Capsular, winged, 3-celled, many-seeded. *Seeds* minute. *Albumen* 0.

BEGO'NIA.

Character essentially the same as the order.

Named in honor of Michael Begon, a French botanist of the 17th century.

B. DI'SCOLOR.—*Leaves* angular, reddish beneath; *stem* nodose; wings of the *capsule* unequal. A popular and curious greenhouse plant, native in China. Stem about 2 feet high, fleshy, smooth, tumid and colored at the nodes. Leaves large, slightly angular, mucronate, serrate cordate-ovate, very

* This order, having been, by mistake, omitted in its usual (and proper?) place, immediately following Cucurbitaceæ, is necessarily inserted here in the present edition, although but slightly, if at all, related to the contiguous families.

unequal at base, petiolate, with weak, scattered prickles and straight, red veins, the under surface deeply reddened. The flowers with their peduncles are of an extremely delicate pink-color in all their parts except the yellow stamens or pistils. Fertile flowers larger than the sterile, and on peduncles twice as long. Wings of the ovary 3, triangular, one of them larger than the other two. Sepals 3(—5?), roundish, 1(—2?) much smaller. Stigmas curiously knotted and twisted. After the flowers, the plants produce numerous axillary and terminal bulblets, from which new plants may be reared, or from seeds or cuttings.

ORDER LXXXIV. PRIMULACEÆ. *The Primrose Tribe.*

Cal.—5 (rarely 4)-cleft, inferior, regular, persistent.
Cor.—5 (rarely 4)-cleft, regular.
Sta.—Inserted on the tube of the corolla, as many as its lobes and opposite to them.
Ova.—1-celled, with a free, central placenta. *Style* and *Stigma* simple.
Fr.—Capsule many-seeded, the fleshy placenta attached only to the base of the cell.

A small, but interesting family of herbs, with opposite (sometimes whorled or alternate) leaves, often all radical, and the flowers on a scape. The species are common in the northern temperate regions, growing in swamps, groves, by rivulets and often among the snow of cloud-capped mountains. Many are beautiful, and highly prized in culture. Properties unimportant.

Conspectus of the Genera.

			Aerial.	*Primula.* 1
		hypocrateriform.	Aquatic.	*Hottonia.* 2
		yellow.		*Lysimachia.* 3
	5-cleft,	rotate,	scarlet.	*Anagallis.* 4
	7 (6—8)-parted, stamens 7 (6—8).			*Trientalis.* 5
0. Corolla	0, calyx campanulate, colored.			*Glaux.* 6
Scales	5 (sterile filaments), alternate with the 5 stamens.			*Samolus.* 7

1. PRI'MULA.

Corolla salver-form, with an open orifice; capsule opening with a 10-cleft dehiscence; stamens 5, not exserted; stigma globose.

Lat. *primus*, first, because its blossoms appear earliest in spring. Herbs (mostly European), with radical lvs. Fls. in involucrate umbels. Cal. tubular, 5-toothed. Cor. 5-lobed, lobes emarginate, tube cylindric.

1. P. VULGA'RIS.—*Leaves* obovate, oblong, rugose, villous beneath, toothed; *umbel* radical; *flower stalks* as long as the leaves; *corolla* flat. Native of Europe. An interesting garden plant, esteemed for its early flowering, and for its being prolific in variation. In its wild state its flowers are yellow and single, but by cultivation they become double, and in the numerous varieties, red, pink, white, orange, purple, &c., and the umbels, in numerous instances, are on a scape. The roots and leaves smell of anise seed, and when dried and powdered are used as a snuff, and also as an emetic. The number of varieties is vast, and is readily increased by cultivation from seed. April. May. Per. *Common Primrose.*

2. P. ELA'TIOR.—*Leaves* toothed, rugose, hairy on each side; *umbel* many-flowered, with the outer flowers nodding; *corolla* flat. Native of Britain. Flowers yellow, scentless, in a simple umbel elevated upon a scape a foot high. Apr. May. Per. *Oxlip Primrose.*

3. P. VERIS.—*Leaves* toothed, rugose, hairy beneath; *umbels* many-flowered, flowers all nodding; *calyx* angular; *corolla* concave. Native of Britan. Flowers yellow. The plant smells strongly of anise. Leaves are used as a potherb, and are recommended for feeding silkworms. Its varieties may be increased by raising from the seed. June. Per. *Cowslip Primrose.*

4. P. AURI'CULA.—*Leaves* obovate, entire or serrate, fleshy; *scape* many-flowered, central, as long as the leaves; *involucre* of short leaves; *calyx* powdery. Native of the Alps. A well known favorite of the florist. The cultivated varieties are innumerable, and many of them of exquisite beauty and fragrance. May. Per. *Auriculate Primrose.*

2. HOTTO'NIA.

Corolla salver-form, 5-lobed with the 5 stamens inserted on its tube; stigma globose; capsule globose-acuminate.

In honor of Peter Hotton, professor in the University of Leyden, died 1709. Fleshy, aquatic herbs, with radical leaves. Cal. deeply 5-cleft, divisions linear. Cor. seg. 5, equal, oblong, notched; tube cylindric, open. Fil. short. Style short. Caps. 5-valved. Seeds many.

H. INFLA'TA. *Ell.* H. palustris. *P.*

Scape articulate, the internodes and lower parts inflated; *flowers* verticillate, pedunculate. A curious aquatic plant, in swamps and stagnant waters. Ms., R. I. and Ct. Stem immersed, round, thick, spongy with a whorl of long and beautifully pectinate leaves at or near the surface of the water. Peduncles or scapes several (6—10) together, arising in a sort of umbel from the top of the stem, 8—10 inches long, inflated between the joints, forming the most remarkable feature of the plant. Flowers small, white, in numerous verticils, generally 4 in each. Pedicels half an inch long. June. Per. *Water Feather.*

3. LYSIMA'CHIA.

Corolla rotate, deeply 5-cleft; stamens 5; stigma obtuse; capsule globose, pointed, 10-valved.

Gr. λυσος μαχη, the translation of which is the English name, *Loose-strife*, from the absurd notion of the ancients that it quieted oxen impatient of the yoke, or according to Linnæus, and also Pliny, from Lysimachus, king of Sicily. Herbs with opposite or verticillate leaves. Flowers solitary, racemose or corymbed. Cal. deeply cleft into 5 acute segments. Fil. dilated and partially united at base. Anth. notched at both ends. Style long as stamens. Seeds few or many.

1. L. THYRSIFLO'RA. *L.* L. capitata. *P.*

Racemes lateral, stalked; *stem* simple, smooth; *leaves* sessile, opposite, lanceolate, acute, punctate, somewhat hoary beneath; *flowers* small, yellow, the number of the parts variable. Grows in swamps about 2 feet high, with an erect, simple stem, bearing many pairs of narrow lanceolate leaves. Clusters somewhat capitate on long, axillary peduncles. Stamens 6—7, much exserted, united into a tube at base. Jn. Per. *Tufted Loosestrife.*

2. L. STRICTA. *Willd.* L. racemosa. *Mx.*

Raceme terminal, long and lax; *petals* lanceolate, spreading; *leaves* lanceolate, sessile, opposite or in 3s. A very distinct species, found in low, wet grounds. Stem upright, smooth as likewise is every other part of the plant,

1—2 feet high, bearing at top a regular, cylindric or conical raceme, 6—8 inches long. Peduncles an inch in length, quite spreading, each with a subulate bract at base. Stamens 2 long and 3 short, united at base. Flowers yellow, spotted with purple. Capsules 5-seeded. After flowering it throws out bulblets from the axils of the leaves, which will produce new plants the following spring. July. Per. *Upright Loosestrife.*

3. L. CILIA'TA.

Flowers nodding; *peduncles* chiefly in pairs; *leaves* cordate-ovate, opposite; *petioles* ciliate. A handsome species, larger than the foregoing, found in gravelly soils, and near rivulets. Root creeping. Stem somewhat 4-sided, 2—3 feet high, simple or with a few opposite branches. Leaves large, pointed, somewhat cordate at base, on petioles fringed with cileæ, the upper ones apparently quaternate. Flowers large, yellow, axillary. Stamens inserted into a ring, nearly equal, with 5 alternate and intermediate rudimentary filaments or teeth. July. Per. *Heart-leaved Loosestrife.*

4. L. HY'BRIDA.

Flowers nodding; *peduncles* axillary; *corolla* crenulate; *leaves* opposite, lanceolate, petiolate, acute at each end; *petioles* ciliate; *stem* smooth, 1—2 feet high, somewhat branched. Grows in swamps. Its stem and flowers resemble those of L. ciliata, from which species it is chiefly distinguished by its narrower, lanceolate, never cordate leaves, and its more numerous and leafy branches, each of which bears a whorl of 4 leaves and 4 flowers at the end. Stamens with intermediate processes. Jl. Per. *Hybrid Loosestrife.*

5. L. QUADRIFO'LIA.

Peduncles 1-flowered, axillary, in 4s; *leaves* verticillate, in 4s and 5s, subsessile, oval, acuminate, punctate; segments of the corolla oval, entire, often obtuse. Grows in low grounds, on river banks, &c. Stem 18 inches high, somewhat hairy, simple, with many whorls of 4—5 leaves, each bearing a flower-stalk in its axil. Corolla yellow with purple lines. Stamens unequal, united at base into a short tube. Anth. purple. Jn. Per. *Four-leaved Loosestrife.*

4. ANAGA'LLIS.

Corolla rotate, deeply 5-cleft; stamens 5, hirsute; capsule globose, circumscissile.

Gr. αναγελαω, to laugh; from its reputed medicinal efficacy in expelling hypochondria. Herbs with square stems and opposite leaves. Fls. solitary, axillary. Cal. deeply cleft in 5 acute, spreading seg. perm. Fil. shorter than cor. erect, slender. Anth. cordate. Stig. capitate. Sds. numerous.

A. ARVE'NSIS.

Stem procumbent; *leaves* ovate, sessile, dotted beneath; segments of *corolla* crenate-glandular. Stem square, 6 inches high, branching, with sessile leaves and small but beautiful scarlet-colored flowers in their axils. Capsules globular 1-celled, splitting across into 2 valves. Corolla scarlet, throat purple. A beautiful trailing plant in sandy fields, &c. It has been called "the poor man's weather-glass"; for its flowers either do not open, or close up again in wet weather, being affected by the moisture of the atmosphere. In fair weather its flowers open at about 8 o'clock, A. M., and close again at 2 P. M.; whence it also serves as one of Flora's timepieces. Flowers in the summer months. Per. *Scarlet Pimpernel.*

5. TRIENTA'LIS.

Corolla rotate, 7-parted, equal; stamens 7; fruit capsular, dry, many-seeded.

Lat. *triens*, the third part of a thing; a name singularly inappropriate. Low, perennial herbs. Stem simple. Fls. terminal, the parts varying from 5s to 8s. Cal. free, 5—8-parted. Cor. deeply divided, seg. elliptical, spreading. Fil. shorter than cor. spreading, equalling the style. Caps. 5—8-valved.

T. AMERICA'NA. *Ph.* T. Europæ'a. *Mx.*

Leaves lanceolate, serrulate, acuminate; *petals* acuminate. This little plant is not uncommon in our woods, and is our only good native example of the Linnæan class, Heptandria. It has a smooth, round, slender stem 3—6 inches high, with an irregular whorl of 5—8 lanceolate, smooth and shining leaves at the top. In the midst of these are 1—4 white, star-like flowers, borne on simple, filiform pedicels. The leaves are mostly acuminate at each end, 3 inches long and 1 wide. Segments of the corolla longer than the acute calyx leaves. Seeds attached to a central, spongy placenta. May, Jn.
Chickweed Wintergreen.

6. GLAUX.

Calyx campanulate. 5-lobed, colored; corolla 0; stamens 5; capsule roundish, surrounded by the calyx, 5-valved, 5-seeded.

Gr. γλαυκος, bluish or glaucous; the plant is a maritime herb with opposite, *glaucous* leaves. Receptacle convex, favulose-punctate.

G. MARI'TIMA.

A small, smooth, fleshy plant, found occasionally in the salt marshes on our seacoast. Root perennial. Stem more or less procumbent at base, 4—6 inches high, smooth, branching, and very leafy. Leaves ¾ inch in length, roundish-ovate, obtuse, entire, nearly or quite sessile, smooth, fleshy and darkly glaucous. Flowers small, sessile, axillary, solitary. Calyx white, tinged with red. July. *Black Saltwort.*

7. SAMO'LUS.

Calyx partly adherent to the ovary; stamens 5, alternating with 5 sterile filaments, (scales); corolla hypocrateriform, 5-cleft; capsule dehiscent at top by 5 valves, many-seeded.

Celtic, *san*, salutary, and *mos*, a pig. Pliny says the plant was considered among the Gauls a specific in all maladies of swine. Herbs with alternate leaves. Fls. racemose. Cal. of a hemispherical, half superior tube and a deeply 5-cleft margin.

S. VALERA'NDI.

Leaves obovate, obtuse; *racemes* many-flowered; *pedicels* bracteolate. An erect, smooth plant in wet, gravely places. Stem a foot high, round, with alternate, entire, broadly lanceolate leaves an inch in length, and tapering to short petioles. Racemes terminal, long. Flowers small, white, their pedicels having a small bractea near the middle. Corolla twice the length of the calyx, the tube broad, the limb bearing the barren filaments between its deep-cleft, obtuse lobes, and the true stamens opposite the latter and alternate with the former. July—Sept. Per. *Water Pimpernel.*

ORDER LXXXV. PLANTAGINACEÆ. *The Plantain Tribe.*

Cal.—4-cleft, persistent.
Cor.—Membranaceous, the limb 4-parted, persistent.
Sta.—4, inserted into the tube of the corolla, alternate with its segments. *Anth.* versatile.
Ova.—2-celled, sessile. *Style* single.
Fr.—Pyxis membranaceous, cells 1—2 or several-seeded.

A small order, but the species are scattered throughout all countries of the globe. They are small and usually stemless herbs, with flowers in spikes. Properties unimportant.

PLANTA'GO.

Calyx 4 (rarely 3)-parted; corolla marescent, with a 4-cleft, reflected border; stamens mostly exserted and very long; capsule ovoid, 2-celled circumscissile.

The ancient Latin name, according to Pliny. Acaulescent herbs. Lvs. all radical. Fls. spicate.

1. P. MAJOR.

Leaves ovate, smoothish, somewhat toothed, with rather long footstalks; *scape* round; *flowers* imbricated; *seeds* numerous. This species is a native of Japan, Europe and America, is very common, always at the door and by the wayside. The leaves are reputed a good external application for wounds, &c. The seeds are eaten by sparrows and other small birds. The root consists of long fibres. Leaves broad, flat, with about 7 ribs, each containing a strong fibre, which may be pulled out. Scape about a foot high with a very long (5—10 inches), cylindric spike. Flowers white, inconspicuous, appearing in succession all summer. Per. *Large Plantain.*

2. P. LANCEOLA'TA. *L.*

Leaves lanceolate, tapering at each end; *spikes* ovate, naked; *scape* angular. Common in pastures and grass-lands. Easily known by its longer leaves tapering at the base into a broad stalk, and with from 3 to 5 strong ribs; by its shorter spike (1—2 inches long), with dark colored calyxes and whitish, projecting stamens, and its slender, upright stalk (8—15 inches long) with prominent angles. Flowering from May to October. It is freely eaten by cattle. Per. *Ribwort Plantain.*

3. P. MARI'TIMA. *L.* P. pauciflora. *P.*

Leaves linear, channelled, nearly entire, woolly at base; *spike* cylindrical, close; *scape* round. Grows in salt marshes. It has a large, perennial root sending up a scape varying in hight from 3 inches to a foot, and numerous, very fleshy, dark-green, linear leaves deeply grooved on the inside, and 6—10 inches long. Spike, slender, of numerous, sub-imbricate, whitish flowers. Aug. *Sea Plantain.*

4. P. ME'DIA.

Leaves ovate, pubescent; *spike* short, cylindric; *scape* round; *seeds* solitary in each cell of the pyxis. Grows in pastures and roadsides, N. Y., flowering all summer. It has broad, flat leaves 2 inches long, covered with a hoary down, and with short footstalks. Spikes shorter than those of *P. major*, being 1—3 inches long and about half a foot high. Flowers white with pink filaments and yellow anthers. Per. *Hoary Plantain.*

5. P. CORDA'TA.

Leaves cordate-ovate, broad, smooth, somewhat toothed; *spikes* very long, flowers somewhat imbricate, lower ones scattered, with ovate, obtuse bractea.

Well marked by its broadly heart-shaped leaves and its elongated spikes which are 6—8 inches long, and on scapes twice as high. Leaves 6 inches long, more or less cordate at base. Corolla white, with obovate segments. Pyxis a third longer than the calyx, with 2 seeds in each cell. Jn., Jl. Per. *Heart-leaved Plantain.*

6. P. VIRGI'NICA.

Leaves obovate-lanceolate, hoary-pubescent, subdenticulate; *scape* angular; *spike* cylindric, pubescent, with flowers somewhat remote. A biennial species, on sandy or stony hills in the southern parts of N. England and N. Y. much smaller than the preceding. The whole plant is covered with a soft grey pubescence. Scape 4—8 inches high, very hairy. Leaves 2—3 inches long, narrowed at base into the petiole, obtuse at the end. Corolla yellowish, with very acute segments including the stamens. Jl. *Virginian Plantain.*

ORDER LXXXVI. PLUMBAGINACEÆ. *The Leadwort Tribe.*

Cal.—Tubular, 5-toothed, plaited, persistent.
Cor.—Regular, hypocrateriform, of 5 petals united at base or sometimes almost distinct.
Sta.—5, hypogynous and opposite the petals or inserted on their claws.
Ova.—1-celled, free from the calyx. *Styles* 5 (seldom 3 or 4).
Fr.—An utricle, or dehiscent by valves. Seed inverted.

The species of this small order are various in appearance, generally perennial herbs, sometimes shrubby. Leaves undivided, alternate or sometimes all radical and the flowers on a scape. They are mostly seaside or salt marsh plants, found in all latitudes.

Properties. The root of Statice Limonium is one of the best and most powerful of all astringents. The species of Plumbago are acrid and escharotic, so much so, that the roots of P. Europæus are said by Lindley to be employed in Europe by beggars, to raise blisters on the face, in order to excite compassion.

STA'TICE.

Calyx infundibuliform, the limb entire, plaited, scarious; petals 5; stamens 5, inserted on the claws of the petals; styles 5; fruit indehiscent, invested with the persistent calyx.

Gr. οταριζω, to stop; for, when used medicinally, this plant stops diarrhœa, says Pliny. Herbs, rarely shrubby. Lvs. simple, entire, alternate or radical. Fls. in spikes or heads. Cor. of 5 petals contracted and united at base, dilated upwards, longer than the stam. Ova. globose, minute. Utricle 1-celled, 1-valved, with 5 points and a solitary seed.

1. S. LIMO'NIUM. *L.* S. Carcliniana. *Walt.*

Scape terete, paniculate; *leaves* all radical, ovate-lanceolate, undulate, smooth, obtuse, mucronate below the tip. Salt marshes. Scape about a foot high, with several lanceolate, clasping bracts, and supporting at top a broad, branching panicle composed of close, secund spikes of sessile, blue flowers. Petals obovate, unguiculate, bearing the stamens on their claws. Leaves narrow, lanceolate, broader in the upper half, smooth, veinless, on long petioles. The root is large, ligneous, strongly astringent, much valued in medicine. Aug.—Oct. Per. *Marsh Rosemary.*

2. S. ARME'RIA.

Scape simple, terete, capitate; *leaves* linear, flat. Native near the coast, Middle and Southern States. A neat, elegant plant, cultivated. Leaves all radical, long, linear, obtuse. Scape a foot high, bearing a terminal head of handsome, rose-colored flowers, in the summer months. Flowers subtended by bracts. The capitum has also a 3-leaved involucre. Per. *Thrift.*

ORDER LXXXVII. LENTIBULACEÆ. *The Bladderwort Tribe.*

Cal.—Inferior, of 2 or 5 sepals united or distinct at base.
Cor.—Irregular, bilabiate, personate, spurred.
Sta.—2, included within the corolla and inserted on its upper lip. *Anth.* 1-celled.
Ova.—1-celled, with a free, central placenta. *Style* 1. *Stigma* cleft.
Fr.—Capsule many-seeded. *Seeds* minute; embryo none.

An order consisting of but two genera. The species are natives of swamps, pools and rivulets, diffused throughout nearly all countries. They are herbaceous, with the showy flowers on scapes, and the leaves all radical, often submersed, undivided or dissected into thread-like segments resembling roots, bearing vesicles of air. Properties unimportant.

Genera.

Calyx 4—5-cleft, capsule 5-celled. . . . . *Pinguicula.*
Calyx 2-parted, subequal. Capsule 1-celled. . . . . *Utricularia.*

1. PINGUI'CULA.

Calyx 4—5-cleft; corolla ringent, spurred at base beneath; stamens 2, very short; stigma bilabiate; capsule 5-celled; seeds many.

Lat. *pinguis*, fat; from the greasy appearance of the leaves. Aquatic herbs. Cor. labiate; upperlip erect, of 3 segments, the 2 lower reflexed. Nectary, a spur from the base of the corolla behind. Fil. curved upwards, short. Anth. close to the stigma. Stig. cleft, upper lip flat, reflexed, covering the anthers.

P. VULGA'RIS.

Spur cylindrical, acute; upper lip of the *corolla* 2-lobed, lower one 3-lobed; *leaves* radical; *flowers* solitary, nodding. A perennial plant, growing upon wet rocks and thin, damp soil, N. Y. Scape 6—8 inches high, with solitary, nodding flowers. Leaves all springing from the root, fleshy, spathulate or ovate, with a tapering base, fleshy and unctious to the touch. Corolla with a purple tube, lined with soft hairs. Flowering early, in April and May.
Butterwort.

2. UTRICULA'RIA.

Calyx 2-parted, subequal; corolla irregularly bilabiate, personate, spurred; stamens 2; stigma bilabiate; capsule globular, 1-celled.

Lat. *utricula*, a little bottle; from the air vessels with which the roots of this genus are appendaged. Aquatic herbs. Cor. with a heart-shaped palate; upper lip erect, obtuse, bearing the stamens; lower lip spurred behind. Fil. incurved. Anth. adhering together. Sds. numerous.

1. U. CERATOPHY'LLA. *Mx.* U. inflata. *Walt.*

Floating; *radical leaves* whorled, inflated. Root very long, branching, suspended in the water by a single, irregular whorl of 5 or 6 floating, inflated leaves which are oblong, cleft, and pinnatifid at the end. Flowers 4—5 together upon a scape 8 inches in length, pedunculated with sheathing bracts. Spur nearly as long as the corolla, appressed to the lower lip, striate, emarginate. Corolla yellow, the upper lip broad-ovate, entire, lower 3 lobed. Ponds. Aug. *Whorled Bladderwort. Millfoil.*

2. U. STRIA'TA.

Floating; *scape* 2—6-flowered, with a few scales; *flowers* large, yellow, upper lip broad, divided into 3 lobes, the middle lobe striate with red; lower

lip crenate, sides reflexed, having dark spots upon the palate; *spur* slender, obtuse, with a notch at the end, pressed against the lower lip of the corolla and nearly as long. Native of swamps. Root submerged, slightly attached to the mud. Leaves (radicles?) few, capillary, appendaged with few air vessels. Scape a foot high, generally with 2 flowers. June. Ann.

3. U. GIBBA.

Floating; *scape* 2—7-flowered; *spur* shorter than the lower lip of the corolla, obtuse, gibbous in the middle. In ponds. Roots dichotomous, the radicles with few air vessels. Scapes 2—3 inches high, bearing generally but 2, small, yellow flowers. Spur obtuse, tumid in the middle. July. Per.

4. U. VULGA'RIS. *L.* U. macrorhiza. *Le Conte.*

Floating; *spur* conical; *stem* submerged; *leaves* multifid, bristly; *spur* incurved; *scape* few-flowered. A curious inhabitant of ditches and standing waters, slightly rooting in the mud below and blossoming above the surface. The root is much branched, floating by means of the vessels attached to it at intervals. These vessels are oval, furnished with an aperture which is closed by a valve and bearded at the margin, and are usually inflated with air. The leaves (radicles?) are minute, with capillary divisions. Scape erect, rising out of the water, and bearing a cluster of 5—9 handsome, yellow flowers. Corolla personate, lower lip larger, with a projecting palate striped with brown; spur of the nectary curved upwards, striated. June, July. Per.
Common Bladderwort.

5. U. PURPU'REA.

Floating; *scapes* 1—2 flowered, axillary; *spur* entire; *flowers* purple, yellow within; *calyx* obtuse, gibbous. In ponds on mountains. Stems (root?) 2—3 feet long. Scapes 2—3 inches commonly 1-flowered. Upper lip truncate; lower lip inflated, 3-lobed. Spur short, obtuse, flattened, bending upwards against the middle segment of the lower lip. The leaves, which some consider bracts, are capillary. Aug. *Purple-flowered Bladderwort.*

6. U. CORNU'TA.

Scape rooting, rigidly erect, scaly, with about 2 sessile flowers; *spur* subulate, acute, longer than the corolla. Native of damp, boggy soils, but never floating, growing abundant in its localities. Scape 8—12 inches high, leafless, but furnished with a few small, distant, pale, ovate scales, and bearing at the top 2—3 large, yellow flowers issuing from between bracts. The calyx consists of 2, ovate, colored leaves. Lower lip of the corolla much larger than the upper, broad, deflexed, emarginate; spur rigid, acute, twice the length of the calyx. Jl., Aug. Per. *Horned Bladderwort.*

7. S. SETA'CEA.

Scape filiform, rooting, 2—3-flowered; upper lip of the *corolla* ovate, revolute, entire; the lower, deeply 3-lobed; *spur* subulate, as long as the lower lip, entire. Swamps. Very slender, leafless. Scape 4—6 inches high, furnished with scales. Flowers yellow, small, the upper lip much smaller than the lower. June. Per.

8. U. PERSONA'TA. *Le Conte.*

Scope rooting, many-flowered; upper lip of the *corolla* emarginate, reclined; lower small, entire; *palate* very large; *spur* linear-subulate, subacute. Bogs. Scape 12—18 inches high, 4—10-flowered, furnished with scales. Flowers yellow, rather large, spur more slender and acute than in U. cornuta. *Beck.*
Snap-dragon Bladderwort.

ORDER LXXXVIII. OROBANCHACEÆ. *The Broom-rape Tribe.*

Cal.—4—5-toothed, inferior, persistent.
Cor.—Irregular, persistent, imbricate in æstivation.
Sta.—4, didynamous. *Anth.* 2-celled.
Ova.—1-celled, free from the calyx, with 2 parietal placenta. *Style* 1. *Stig.* 2-lobed.
Fr.—Capsule enclosed within the withered corolla, 1-celled, 2-valved, each valve bearing one simple or 2-lobed placenta in the middle.
Sds.—Very numerous and minute.

A small order of herbs, destitute of leaves or other green foliage, growing parasitically on the roots of other plants. Stem furnished with scales, and bearing solitary or spicate flowers. The species are mostly natives of the northern temperate zone. Properties astringent and bitter.

Genera.

Flowers perfect. Stem simple or divided.	*Orobanche* 1
Flowers monœciously polygamous. Stems branching.	*Epiphegus.* 2

1. OROBA'NCHE.

Calyx 2—5 cleft, the segments often unequal; corolla ringent, limb 4—5-lobed; ovary seated in a fleshy disk; capsule ovoid, acute, 1-celled, 2-valved, many-seeded.

Gr. οροβος, a vetch or some other leguminous plant, and αγχειν, to strangle; because these parasites were supposed to destroy whatever they grew upon. Herbaceous, parasitic? destitute of green herbage, leafless, the stem clothed with scales. Flowers spicate or solitary. Cor. tube curved, inflated, limb spreading; upper lip concave, notched, lower reflexed, 3-cleft. Fil. concealed under the upper lip. Anth. approximate, awned.

1. O. UNIFLO'RA. *L.* O. biflora. *Nutt.*

Scapes in pairs, naked, each 1-flowered. A small, leafless plant, with the general aspect of a Monotropa, found in woods and thickets. Root short, thick, smooth, scaly, surmounted by a stem not exceeding half an inch in length. This divides at its top, generally into 2, scape-like, erect, round, simple, naked peduncles, 4—5 inches high, downy, purplish white, with a nodding flower at the top, of the same hue. A dozen or more such flower stalks are often found clustered together. June, July. Per.
One-flowered Broomrape.

2. O. AMERICAN'A.

Stem simple, covered with oval-lanceolate, imbricated scales; *spike* smooth, terminal; *corolla* recurved; *stamens* exsert. Woods. Stem very thick, 4—6 inches high, very smooth, brownish yellow, leafless, closely imbricated with pale, polished, oval scales. The spikes are dense. Bracts pale and smooth like the scales of the stem. Corolla tubular, bent downwards, the upper lip vaulted, yellow. Calyx irregularly divided into jagged segments, with 2 bracts at base. July. Per. *American Broomrape.*

2. EPIPHE'GUS.

Monœciously polygamous; calyx abbreviated, 5-toothed. *Sterile fl.*—Corolla ringent, compressed, 4-cleft, lower lip flat. *Fertile fls.*—Corolla minute, 4-toothed, deciduous; capsule truncate, oblique, 1-celled, 2-valved, opening only on one side.

Gr. επι, upon, and φηγος, the beech; being supposed parasitical on the roots of that tree. Herbs, destitute of green herbage, leafless, with virgate, simple branches which are floriferous in their whole length.

E. AMERICANUS. *Nutt.* Orobanche Virg. *L.*

Stem branched leafless; *flowers* remote, alternate; *corolla* 4-toothed, deciduous. This is said to be a parasitic plant growing from the roots of beech trees. It is indeed often found in beech woods, but I have seen it in situations too remote from any tree of that kind to consist with the notion, that it grows exclusively in such localities. Root a scaly ball covered with stiff, short and brittle radicles. Stem a foot high, with slender and irregular branches given off the whole length of it. Instead of leaves it has only a few small, ovate scales, one at the base of each branch. Flowers alternately scattered on each branch, the upper ones barren, with recurved corollas, brownish white, with darker stripes above. Fertile ones smaller, deciduous. The whole plant is of a dull red color. Aug. Sept. *Beech-drops.*

ORDER LXXXIX. BIGNONIACEÆ. *The Trumpet-flower Tribe.*

Cal.—5-parted or bilabiate, sometimes spathaceous.
Cor.—Tube broad, with an irregular, 5-lobed or bilabiate limb.
Sta.—5, 1 or 3 sterile, often didynamous. *Anthers* 2-celled.
Ova.—2-celled, seated in a fleshy disk. *Style* 1. *Stigma* of 2 plates.
Fr.—Capsule coriaceous, 1—2-celled, 2-valved, many-seeded.
Sds.—Generally winged, destitute of albumen.

Trees, sometimes shrubby or climbing plants. Leaves opposite. Flowers large, showy. Most of the species are North American. Others are diffused in all countries, particularly within the tropics. Several of the Brazilian species of Bignonia afford a valuable timber. But this order is best known for the beauty of its flowers.

Genera.

Calyx 5-toothed. Stamens 4 fertile. Climbing shrubs. . . . . *Bignonia.* 1
Calyx 2-parted. Stamens 2 fertile, with 2 or 3 abortive. Trees. . . . *Catalpa.* 2

1. BIGNO'NIA.

Calyx 5-toothed, cyathiform; corolla campanulate, 5-lobed, ventricose beneath; stamens didynamous; pod 2-celled; seeds with membranous wings.

Named by Tournfort in honor of Abbè Bignon, a distinguished patron of science, librarian to Louis XIV. A large and noble genus of trees and shrubs, chiefly tropical. Leaves opposite, pinnate, ternate or conjugate. Fls. panicled, large and beautiful.

B. RA'DICANS.

Leaves pinnate, leaflets ovate, dentate, acuminate; *corymb* terminal; tube of the *corolla* 3 times as long as the calyx; *stem* creeping, rooting. The trumpet-flower is a climbing shrub of great beauty, indigenous in the middle latitudes of the U. S. In its native woods it supports itself on trees by roots issuing from the joints, to the hight of 30 or 40 feet. It is cultivated both in this country and in Europe. It is hardy and is generally trained against the walls of buildings. The flowers are produced at the ends of the new shoots, in large and numerous clusters. Corollas with long swelling tubes, orange-colored. One variety has yellow-scarlet flowers; another bright scarlet. June—Aug. *Trumpet-flower.*

2. CATA'LPA.

Calyx 2-parted; corolla campanulate, 4—5-cleft, the tube inflated; stamens 2 fertile, 2 or 3 sterile; stigma 2-lipped; capsule 2-celled, long, cylindric.

This plant is called *Catalpa* by the Indians. American trees. Flowers paniculate. Dissepiment of the pod-shaped fruit opposite the valves.

C. CORDIFO'LIA. *Ell.* Bignonia Catalpa. *L.*

Leaves cordate, smooth, entire; *flowers* in panicles. A fine, wide-spreading tree, native in the Southern States, but cultivated in many places at the North, for ornament and shade. In favorable circumstances, it attains the hight of 50 feet, with a diameter of nearly 2 feet. It exhibits a wide-spreading top, with comparatively few branches. Its leaves are beautifully heart shaped, and smooth, resembling those of the lilac, but much larger. In color the bark is a light, shining gray. In May it puts forth blossoms in great profusion. Their form is campanulate, color white, with yellow and violet spots. Capsule cylindric, pendent, a foot in length; seed winged. *Catalpa.*

ORDER XC. PEDALIACEÆ. *The Oil-seed Tribe.*

Cal.—5-cleft, nearly equal.
Cor.—Hypogynous, irregular, tube ventricose, limb 3—5-lobed, mostly bilabiate.
Sta.—4 (with the rudiment of a 5th), didynamous.
Ova.—1—2-celled, of 2 carpels. *Style* 1. *Stigma* divided.
Fr.—Drupaceous or capsular, often 2—4-horned, sometimes with 4—8 spurious cells formed by the divergent lobes of the placenta cohering with the walls of the pericarp.
Sds.—Few, large, wingless.

An unimportant order of herbs with opposite, angled leaves. Flowers axillary. Natives of tropical America, &c. Some of them have been introduced into the United States.

Genera.

Corolla 5-lobed. Leaves suborbicular.	*Martynia.*	1
Corolla 3-lobed. Leaves ovate-lanceolate.	*Sesamum.*	2

1. MARTY'NIA.

Calyx 5-cleft; corolla ringent; capsule ligneous, corticate, 4-celled, 2-valved, each valve terminating in a long hooked beak.

Named in honor of Martyn, a distinguished English botanist. Handsome annual herbs, natives of the Middle and Southern States. Lvs. palmate-veined. Fls. disproportionately large.

M. PROBO'SCIDA.—*Stem* viscidly pubescent, branched, branches mostly decumbent; *leaves* alternate, cordate, suborbicular, entire, villous; *flowers* on long, axillary peduncles. Native on river banks in Pennsylvania, sometimes cultivated for ornament in our gardens. Stem 1—2 feet long. Leaves paler beneath. Corolla pale, dull yellow, very large, the limb nearly as broad as the leaves, spotted with brownish purple. Stamens bright yellow, exserted. Aug. Sept. *Beaked Martynia.*

Other ornamental species are *M. diandra*, flowers pink, spotted with purple; and *M. lutea*, flowers deep yellow.

2. SE'SAMUM.

Calyx 5-parted; corolla campanulate, 3-cleft, the lower lobe the longest; stigma lanceolate; capsule 2-celled, the cells divided by the inflexed edges of the valves.

Named from the Arabic, *semsem*. Oriental, annual herbs.

S. I'NDICUM.—*Leaves* lanceolate-ovate, lower ones 3-lobed, upper ones undivided, serrate. Native of E. India. Stem erect, about 18 inches high. Leaves alternate, entire. Flowers axillary, subsessile. Corolla pale purple. The seeds yield an excellent oil which will keep several years without injury. It is used in cookery for all the purposes of sweet oil. Five pounds of the seeds yield about one pound of oil. The leaves are emollient. *Oily-seed.*

ORDER XCII. SCROPHULARIACEÆ. *The Figwort Tribe.*

Cal.—Sepals 4 or 5, unequal, more or less united at base, inferior, persistent.
Cor.—Bilabiate, personate or otherwise irregular, the lobes imbricate in æstivation.
Sta.—4, didynamous, rarely with the rudiment of the 5th; sometimes 2 only, the 3 others either rudimentary or wholly wanting.
Ova.—Free, 2-celled, many seeded. *Style* simple. *Stigma* 2-lobed.
Fr.—Capsule 2-celled, 2-valved, with central placentæ.
Sds.—Indefinite, albuminous. *Embryo* straight.

A large order of herbaceous, rarely shrubby plants, with opposite, verticillate or alternate leaves. They are found in every part of the world, from the equator to the regions of perpetual frost. They constitute about 1-36 of the Phænogamia of N. America. *Lindley.*

Properties. Generally acrid, bitter and deleterious plants. The most remarkable officinal species of the tribe is the foxglove (*Digitalis*), which exercises a wonderful control over the action of the heart, in regulating its pulsations. It is also employed in cases of dropsy, hemorrhage, &c. Taken in excess it speedily causes death. The Veronica Virginica, (Culvers Physic) and Linaria vulgaris (toad-flax) are purgative and emetic. Numerous species are cultivated for ornament. Nearly all of them turn black in drying.

Conspectus of the genera.

* Flowers diandrous.

Corolla	tubular,	bilabiate,	upper lip emarginate,	erect.	*Gratiola.* 10
				reflexed.	*Lindernia.* 11
			upper lip 5-lobed and many-cleft.		*Schizanthus.* 5
		campanulate. Stamens and style much exsert.			*Leptandra.* 16
	subrotate, limb 4-lobed, lower lobe smallest.				*Veronica.* 15

* * Flowers pentandrous.

Corolla subrotate, nearly regular. Stamens 5, all fertile.	*Verbascum.* 1

* * * Flowers didynamous.

Divisions of the calyx					
	Sterile filament 0.	Corolla subequal, bilabiate.	Corolla equal at base, spurred at base beneath.	Seeds many.	*Mimulus.* 9
				Seeds 2—3.	*Collinsia.* 13
			Corolla equal at base, gibbous at base beneath.		*Linaria.* 3
					Antirrhinum. 4
			Corolla bilabiate.	Leaves alternate.	*Digitalis.* 8
				Leaves opposite.	*Gerardia.* 17
		Corolla subequal, tube slender.			*Buchnera.* 14
		Corolla equal. Seape 1-flowered.			*Limosella.* 12
5.	Sterile filament 1, free, adherent to the subglobose corolla.			shorter, smooth at the end.	*Chelone.* 6
				longer, bearded at the end.	*Pentstemon.* 7
					Scrophularia. 2
				serrate.	*Rhinanthus.* 18
				Leaves opposite, subentire.	*Melampyrum.* 23
4.	Corolla yellow.			Leaves alternate. Bracts colored.	*Bartsia.* 20
	Corolla dark purple.				*Schwalbea.* 21
2, or it is obliquely truncated.				Bracts green.	*Pedicularis.* 22
				Bracts scarlet.	*Euchroma.* 19

1. VERBA'SCUM.

Corolla rotate, 5-lobed, unequal; stamens 5, declinate, all perfect; capsule ovoid-globose, 2-valved.

Lat. *barba*, a beard; a name significant of the beard with which the plant is covered. Herbs (often suffruticose). Lvs. alternate. Fls. in dense spikes or paniculate racemes. Cal. of 5 deep, acute seg. Cor. of a short tube and

a limb deeply divided into 5 rounded seg. Fil. unequal, some of them woolly, shorter than cor. Anth. reniform. Style longer than stam. Caps. 2-celled. Sds numerous, small.

1. V. THAPSUS.

Leaves decurrent, densely tomentose on both sides; *raceme* spiked, dense; three of the *stamens* downy, two of them smooth. The tall, dense, club-shaped spikes of the common mullein are very conspicuous in every slovenly field and by all roadsides. Stem erect 3—5 feet high, woolly, its angles winged by the decurrent base of the leaves, generally simple, occasionally with one or two branches above. Leaves very rough with dense wool on both sides. Flowers rotate, of a golden yellow, nearly sessile. Notwithstanding its frequency, the mullein is generally supposed to have been introduced. June—Aug. *Common Mullein.*

2. V. BLATTA'RIA.

Leaves clasping, oblong, smooth, serrate; *peduncles* 1-flowered, solitary. Grows in waste grounds, roadsides, not common. Stem 3 feet high, branching above, bearing a terminal, leafy raceme 2—4 inches long. Lower leaves oblong, obovate; upper ones cordate-ovate, all coarsely and doubly serrate. Flowers on pedicels near an inch in length. Corolla yellow or white, marked with brown at the back. Stamens unequal, purplish, the filaments all hairy. June, July. Ann. *Moth Mullein.*

2. SCROPHULA'RIA.

Calyx in 5 acute segments; corolla subglobose, limb contracted, sub-bilabiate, lip with an internal, intermediate scale (sterile filament); capsule 2-celled; valves with 2 inflated margins.

So named from the resemblance of the roots to scrofulous tumors. Hence also it was used to cure that disease. Mostly herbs, with opposite leaves. Cor. ovoid, limb very small.

1. S. MARILA'NDICA.

Leaves cordate, acute, serrate, rounded at the base; *petioles* ciliate below; *stem* obtusely angled. Inhabits woods. Abundant on Iris island, Niagara Falls and elsewhere. Stem square, with obtuse angles, smooth, 4—6 feet high, with paniculate, opposite branches above. Leaves 3—5 inches long, smooth, thin, obtuse at base and decurrent on the petiole, with a long, pointed summit, and double serratures. Flowers on a thin, erect, terminal panicle, roundish, resembling capsules. Corolla greenish purple, contracted at the throat. Limb somewhat 2-lipped, having a green scale (sterile filament) within, adnate to the upperside of the tube. Jl.—Oct. Per. *Figwort.*

2. S. LANCEOLA'TA.

Leaves lanceolate, unequally and incisely serrate, acuminate, acute at base; *petioles* naked; fascicles of the *panicle* corymbed. In wet meadows and woods, rare. Stem 3—5 feet high. Flowers greenish yellow. Aug. Sept. Per. *American Figwort.*

3. LINA'RIA.

Calyx 5-parted; corolla personate, upper lip bifid, reflexed; lower lip 3-cleft; throat closed by the prominent palate; tube inflated, with a spur behind; capsule 2-celled, bursting at the summit.

Lat. *linum*, flax; from the long, narrow leaves of some of the species, which much resemble those of flax. Herbs. Lvs. mostly alternate. Fls. solitary, axillary, often forming terminal, leafy racemes.

1. L. VULGA'RIS.

Leaves linear-lanceolate, crowded; *spikes* terminal; *flowers* dense, imbricate; *calyx* smooth, shorter than the spur. A very showy plant common by roadsides, &c. Stems erect, smoothish, 1—2 feet high, very leafy and with numerous, short, leafy branches. Flowers large and numerous, crowded in a long, terminal spike. Corolla of a curious and grotesque form, furnished with a long tail or spur, the mouth closed by a prominent palate from the under lip. By lateral pressure it opens, closing with a spring when the pressure is removed. Color a brilliant yellow except the palate which is of a rich orange. July, Aug. Per. *Toad Flax. Snap-Dragon.*

2. L. CANADE'NSIS.

Leaves scattered, erect, linear, obtuse; *flowers* racemed; *stem* simple; *scions* procumbent. A smaller, annual species in roadsides, &c. Stem very slender, nearly simple, curving upwards from the decumbent base, about a foot high, smooth, furnished with small, remote leaves. A few leafy, prostrate or ascending shoots are given off from the base of the stem. Flowers small, blue, in a loose raceme at the end of the stems. Throat closed by the light blue palate. Spur filiform, as long as the corolla. June—Sept. *Canadian Snap-dragon.*

3. A. ELATI'NE.

Procumbent, hairy; *leaves* alternate, hastate, entire; *peduncles* solitary, very long. Fields. A small, slender species. Stem creeping, 1—2 feet in length. Corolla yellow, the upper lip bright purple beneath, on long stalks. Calyx hairy, as well as the whole plant. Jn.—Sept. *Creeping Snap-dragon.*

4. A. TRIORNITHO'PHORUM.—*Leaves* whorled, lanceolate, 3-nerved; *stem* decumbent; *racemes* terminal, few-flowered; *corolla* very large, pedunculate. A curious plant of the flower garden, from Portugal. It is remarkable for the form of its flowers which resemble three little birds seated in the spur. *Three-bird Snap-dragon.*

4. ANTIRRHI'NUM.

Calyx 5-sepaled; corolla gibbous (not spurred) at base, the upper lip bifid, reflexed; lower trifid, closed by the prominent palate; capsule valveless, dehiscent by 3 pores.

Gr. αντι, like, ῥὶν, a nose; from the resemblance of the flowers to the snout of some animal. European herbs with opposite leaves.

A. MAJUS.—*Leaves* lanceolate, opposite; *flowers* racemed; *sepals* glandular-hairy, lanceolate, acute. An elegant and popular garden flower, native of England. Grows 1 or 2 feet high. Flowers large, pink-colored, the lower lip white and the mouth yellow, with a gibbous prominence at base beneath. There are varieties with scarlet, scarlet and white, and double flowers. *Great Snap-dragon.*

5. SCHIZA'NTHUS.

Corolla irregular, the upper lip 5-cleft, lower much smaller, 3-parted; filaments 4, 2 of them sterile; capsule 2-celled.

Gr. σχιζω, to cut, ανθος, a flower; in allusion to the numerous divisions of the showy corolla. Herbaceous. Lvs. alternate, pinnatifid. Peduncles supra-axillary.

S. PINNATUS.—The only species. It is one of the most delicate and beautiful of our cultivated flowers, native of Chili. Stem a foot or more high, branched. Leaves on short stalks, pinnate or rather deeply pinnatifid. Clusters of flowers opposite the leaves. Calyx and stalks viscidly pubescent. Corolla with numerous divisions, purple and yellow, with a dark spot in the midst. *Pinnated Schizanthus.*

6. CHELONE.

Calyx deeply 5-parted, with three bracts at base; corolla inflated, bilabiate, the fifth filament abortive, smooth above, shorter than the rest; anthers woolly.

Gr. χελωνη, a tortoise; from a fancied resemblance of the flower to the head of that animal. Herbs with opposite leaves. Cor. tubular, border small, closed, upper lip emarginate, lower lip slightly trifid. Caps. 2-celled, 2-valved. Seeds with a membranous margin.

C. GLABRA.

Smooth; *leaves* opposite, oblong-lanceolate, acuminate, serrate; *flowers* densely spiked. A plant of brooks and wet places, with flowers shaped much like the head of a snake, the mouth open and tongue extended. Stem mostly simple, 2 feet high, erect. Leaves opposite, of a dark and shining green above, with irregular serratures, and sessile or nearly so. Flowers large, in a short, terminal, dense spike. Corolla white, often tinged with red, inflated, contracted at the mouth, with short, gaping lips. Filaments hairy. Style long, exsert, bending downwards. Aug. Sept. Per. *Snake-head.*

7. PENTSTE'MON.

Calyx deeply 5-cleft; corolla ventricose, bilabiate; the fifth filament sterile, bearded, longer than the rest; anthers smooth.

Gr. πεντε, five, and στημον, stamen; this genus, like Chelone, from which it was taken, has 5 stamens, 4 perfect and 1 abortive. Herbs (rarely suffruticose) with opposite leaves and the flowers in panicles. Caps. 2-celled, 2-valved, ovoid. Seeds numerous, angular.

1. P. PUBE'SCENS. *Willd.* Chelone Pentsemon. *L.*

Stem hairy; *leaves* serrulate, oblong-lanceolate, sessile; *flowers* panicled; *sterile filament* bearded from the end to the middle. River banks; hill sides. About Fort Niagara, &c Stem 1—2 feet high, round, smooth below, pubescent above, with a diffuse, oppositely branching panicle at top. Leaves smooth, lanceolate, entire or denticulate, the lower ones narrowed at base into a footstalk. Flowers purple with a light colored throat. Calyx equalling the short tube. Corolla an inch in length. Barren filament broader above, the two edges densely bearded. Style about as long as stamens, persistent. June. Per. *Beard-tongue.*

α. *Leaves* broad and smooth.

β. *Leaves* narrow, hairy and obscurely denticulate.

2. P. LÆVIGA'TA. *L.* Chelone lævigata. *Walt.*

Smooth; *leaves* oblong-ovate, clasping, toothed, lower ones stalked, entire; *flowers* panicled; *sterile filament* bearded only near the summit. Stem smooth, 2 feet high, with a branching panicle at top. Flowers light purple. July. Per.

8. DIGITA'LIS.

Calyx 5-parted; corolla campanulate, ventricose, in 5 subequal lobes; capsule ovate, 2-celled, 2-valved, with a double dissepiment.

Lat. *digitabulum*, a thimble; from the form of the flowers. Herbaceous. Stems simple. Lvs. alternate or radical. Fls. racemose, showy.

D. PURPU'REA.—*Leaves* oblong, rugose, crenate; *calyx segments* ovate-oblong; *corolla* obtuse, upper lip entire; *peduncle* as long as the calyx Native of Europe. A well known, showy border flower of easy culture. It is a biennial plant 2—3 feet high, with large, rough, downy leaves. Flowers numerous, in a long, simple spike, large, crimson, often white, with beautiful eye-like spots within. The whole plant is a violent and dangerous poison when taken in considerable quantities, producing delirium, convulsions and death. But in the hand of the judicious physician it becomes a valuable medicine, acting as a sedative and diuretic. July. *Purple Foxglove.*

Several other species of the Digitalis are often found in collections, among which are the *intermedia*, with the upper lip of the corolla more distinctly notched; the *ochroleuca*, with large, yellow flowers; the *Thapsi*, with mullein-like leaves, all radical and flat on the ground; *Lencophæa*, with very large, dense, leafy racemes of dusky white flowers, the lower lip of the corolla unguiculate, lunate.

9. MI'MULUS.

Calyx prismatic, 5-toothed; corolla ringent, the upper lip reflected at the sides; palate of the lower lip prominent; capsule 2-celled, many-seeded; stigma thick, bifid.

Gr. μιμω, an ape; the flowers in front have been likened to the face of a grinning monkey. Herbs. Stem quadrangular. Lvs. opposite. Fls. axillary, solitary.

1. M. RINGENS.

Leaves sessile, smooth, lanceolate, acuminate; *peduncles* axillary, longer than the flowers. A common inhabitant of ditches and mud soils, with large, blue, ringent flowers. Stem erect, square, smooth, about 2 feet high. Leaves sessile, opposite, serrate, acute, lanceolate Peduncles about as long as the leaves, square, curved upwards, axillary and opposite. Calyx tubular, 5-angled and 5-toothed. Corolla pale blue, yellow within. July, Aug. Per. *Monkey-Flower.*

2. M. ALA'TUS.

Leaves petiolate, smooth, ovate, acuminate; *peduncles* axillary, shorter than the flowers; *stem* winged at the 4 corners. This, like the last species, inhabits ditches and other wet places, and grows to nearly the same hight. The square stem, erect, smooth and winged at the 4 angles, affords an adequate distinction. Leaves stalked, ovate. Flowers ringent, on short stalks, light purple. Calyx teeth rounded, mucronate. Aug. Per. *Winged Monkey-flower.*

10. GRATIO'LA.

Calyx deeply 5-parted, mostly with 2 bracts at base; corolla subbilabiate, upper lip emarginate, lower 3-lobed; stamens 2 fertile, mostly with 3 sterile filaments; capsule 2-celled.

Lat. *gratia*, favor; alluding to its medicinal virtues. Herbs with opposite leaves. Peduncles axillary, solitary, 1-flowered.

1. G. AU'REA.

Smooth; *leaves* oblong-lanceolate, subentire, half-clasping; *sterile filaments* 2, minute. A small, perennial herb, 6—8 inches high, frequenting the borders of muddy ponds and other moist places. Stem declining and rooting at the base, quadrangular, simple or branching. Leaves opposite, sessile, a little clasping, smooth, punctate, acute or nearly so, often with a few teeth near the end. Flowers yellow, axillary, alternate, on slender stalks, as long as the leaves. Filaments 4, adhering to the corolla, 2 of them minute, without anthers. Aug. Per. *Hedge Hyssop.*

2. G. VIRGI'NICA.

Stem pubescent; *leaves* lanceolate, subacute; *sterile filaments* none. In wet places. Stem 4—8 inches high, more or less pubescent, round, declining and branching at base. Leaves one to two inches long, and one third as wide, smooth, lanceolate, sessile, dentate or nearly entire near the ends, subconnate or amplexicaul. Corolla white or pale-yellow, pubescent within, twice as long as the calyx, and on long, pubescent stalks. Calyx with 5 equal segments, and 2 bracts which are linear-lanceolate and rather longer than the sepals. July. Per. *Creeping Hyssop.*

11. LINDE'RNIA.

Calyx deeply 5-parted, naked at base; corolla bilabiate, ringent, upper lip short, reflexed, lower lip 3-cleft, unequal, carinate; stamens 4, the 2 longer ones forked and sterile; anthers cohering; capsule 2-celled, 2-valved.

Name in honor of Von Lindern, a physician and botanist of Strasburg. Herbs with opposite leaves. Peduncles axillary, solitary, 1-flowered. Dissepiment of the capsule parallel with the valves.

1. L. DILATA'TA. *Muh.* L. pyxidaria, *P.*

Leaves dilated at base, scarcely toothed, clasping; *peduncles* alternate, longer than the leaves; *corolla* twice as long as the calyx. A small aquatic herb, flowering in August, in ponds and wet meadows. Stem smooth, 6 inches high, square, brittle and occasionally branched. Leaves small, slightly and remotely toothed. Flowers pale blue, upper ones sometimes opposite. July. Aug. Ann. *Lindern Pimpernel.*

2. L. ATTENUA'TA.

Leaves obovate-lanceolate, tapering at base; *peduncles* shorter than the leaves. A plant about the size of the last, and found in similar situations. Stem erect or procumbent, smooth, thickened, quadrangular, with opposite, spathulate leaves. Flowers blue, on stalks nearly or quite as long as the leaves. Aug. Ann. *False Hedge Hyssop.*

3. L. MONTI'COLA.

Stem slender, dichotomous; *radical leaves* spathulate, *cauline ones* few, linear, small and remote; *peduncles* very long, at length deflected. White

Mts. N. H. Stem smooth, square, erect, 4—6 inches high. Radical leaves obscurely toothed, punctate. Flowers pale blue, on peduncles an inch or more in length. June. Per.

12. LIMOSE'LLA.

Calyx 5-cleft; corolla shortly campanulate, 5-cleft, equal; stamens approximating in pairs; capsule partly 2-celled, 2-valved, many-seeded.

Lat. *limus*, mud; the plant grows by the edge of puddles and muddy places. Small, aquatic herbs. Lvs. radical. Scape 1 flowered.

L. SUBULA'TA. *Ives.*

Leaves linear, very narrow, scarcely dilated at the apex; *scape* 1-flowered, as long as the leaves. A minute plant, an inch in hight, growing on the muddy banks of rivers. Leaves and flower-stalks radical. Flowers very small, blue and white. Aug. Per. *Mudwort.*

13. COLLIN'SIA.

Calyx 5-cleft; corolla bilabiate, orifice closed, upper lip bifid, lower trifid, with the middle segment carinately saccate and closed over the declinate style and stamens; capsule globose.

Named by Mr Nuttall in honor of Z. Collins, Esq., of Philadelphia. Annual herbs with opposite or verticillate leaves. Inflorescence axillary. Caps. partly 1-celled and imperfectly 4-valved. Seeds 2—3, umbilicate.

C. VERNA. *Nutt.*

Leaves oblong-ovate, sessile, obtuse, the lower ones attenuated at base into a long petiole; *peduncles* long, axillary, 1-flowered. Grows on the banks of streams, particularly of the Mohawk, &c., in the vicinity of Utica, according to *Dr. Gray.* Stem a foot high, minutely pubescent. Leaves obtuse, pubescent, opposite or verticillate. Flowers opposite or verticillate. Corolla variegated with blue, red and white. July. *Tall Pink.*

14. BUCHNE'RA.

Calyx 5-toothed; corolla tube slender, limb flat, in 5 cordate, subequal lobes; capsule 2-valved.

In honor of J. G. Buchner, a German botanist, 1743. Herbs with the leaves and flowers opposite, the latter in a terminal spike. Cor. nearly regular. Stam. very short, included. Style as long as the tube. Caps. ovoid-oblong, obtuse, 2-celled, dehiscent at the summit. Seeds minute, striate.

B. AMERICA'NA.

Leaves ovate-lanceolate, denticulate, scabrous, 3-nerved, sessile; *flowers* remotely spiked. In low grounds. Stem 1—2 feet high, simple or slightly branched, slender and terete, ending in a long, loose and somewhat virgate spike of purple flowers. Leaves 1—2 inches long, very rough, appressed to the stem. Flowers axillary and sessile. Stamens inserted 2 in the throat of the corolla and 2 in the middle of the tube. Calyx half as long as tube of corolla. Aug. Per. *Blue-hearts.*

15. VERO'NICA.

Calyx 4-parted; corolla subrotate, deeply 4-cleft, lower segment narrow; stamens 2, sterile filaments 0; capsule obcordate, 2-celled, few-seeded.

Etymology doubtful; perhaps named for St. Veronica. Mostly herbs with opposite leaves. Style thread-shaped, declining, as long as the stamens. Caps. compressed at the summit.

* Racemes terminal.

1. V. SERPYLLIFO'LIA.

Raceme somewhat spiked, terminal; *leaves* oval, slightly crenate, smooth; *capsule* broad-obcordate, as long as the style A small plant, often concealed among the grass in meadows, and unconsciously trodden under foot. The stem is decumbent and rooting at the base, 3—6 inches in length, branching, very smooth. Leaves opposite, with short petioles, smooth, obtuse, 3-nerved and somewhat fleshy. Flowers in long, terminal and subterminal racemes, with oval bracts. Corolla beautifully variegated with blue and white, and striped with violet lines. Root of long, white fibres, perennial. Flowers in May and June, in pastures and roadsides. *Smooth Speedwell.*

* * Racemes axillary.

2. V. OFFICINA'LIS.

Leaves broadly ovate or elliptical, serrate, rough, pubescent, on short petioles; *stem* procumbent, branched, spreading. The whole plant is rough with short hairs, trailing, about a foot in length, with ascending branches. The leaves vary from ovate to obovate, but are generally elliptical, one to one and a half inches in length. The flowers are pale-blue, forming rather long, axillary, erect, pedunculate spikes. Found in dry woods and open fields. May—Jl. Per. *Officinal Speedwell.*

3. V. SCUTELLA'TA.

Racemes lateral, alternate; *pedicels* divaricate; *leaves* linear, slightly indented. A slender, weak, perennial herb, with long, narrow leaves (2—3 inches long and 2 lines wide). Stem rarely a foot high. The racemes are axillary, with pale, flesh-colored flowers, pencilled with purple lines. Peduncles and pedicels extremely slender, the latter bent quite back as the capsule ripens. June—Aug. *Marsh Speedwell.*

4. V. ANAGA'LLIS.

Racemes lateral opposite; *leaves* lanceolate, serrate; *stem* erect. A smooth, succulent plant of aquatic habits, frequenting the borders of brooks and pools. Stem obtusely 4-angled, 1—2 feet high. Leaves smooth, sessile on short petioles, one and a half to two and a half inches long. Flowers purplish, in long, loose, axillary racemes. Pedicels not reflexed, 3—5 lines long. Peduncles thickened. June, July. Per. *Water Speedwell.*

5. V. BECCABU'NGA.

Racemes lateral, opposite; *leaves* elliptical, obtuse, somewhat serrate, glabrous. Stem procumbent, rooting at the base, generally floating, round, smooth and shining, like every other part of the herb, and extending 1—2 feet. Leaves of a bright green, 1—2 inches long. Flowers of a rich sky-blue, in long, slender, pedunculate clusters. Flowers in June and July. Brooks and clear waters. Per. *Brooklime Speedwell.*

* * * Flowers axillary, solitary.

6. V. AGRE'STIS.

Stem procumbent, diffusely branching; *leaves* cordate-ovate, petiolate, deeply serrate, floral ones lanceolate; *peduncles* as long as the leaves. A small, pilose plant, 2—8 inches long, with a round, leafy, hairy stem, branching mostly at the base. The leaves are roundish ovate, shorter than their petioles, the upper alternate. Flowers small, light blue, veined, their stalks recurved in fruit. Segments of the calyx fringed, ovate equal. Seeds concave beneath. Flowering from May to September, in cultivated fields, less common than the next species. Ann. *Neckweed.*

7. V. ARVE'NSIS.

Stem erect or assurgent; *flowers* nearly sessile; *leaves* cordate-ovate, incisely crenate, the lower ones petioled, upper ones alternate, lanceolate, crenate, sessile. A small, pubescent, pale-green plant, 2—6 inches high. Stem nearly erect, branching from the base, the leaves assurgent. Flowers on short peduncles, corolla shorter than the calyx, pale blue, beautifully penciled with purple lines. Frequent in dry fields. May. June. Ann. *Corn Speedwell.*

8. V. PEREGRI'NA.

Stem erect; *flowers* solitary, sessile; *leaves* oblong, serrate, rather obtuse. Common in moist, clayey soils. The whole plant is smooth. Stem often branched at the base, 4—8 inches high. Radical leaves ovate, on short stalks; those of the stem narrow, sessile. Flowers small, white or pale blue. Capsule compressed. Introduced. May—Jl. Ann. *Purslain Speedwell.*

16. LEPTA'NDRA.

Calyx 5-parted, segments acuminate; corolla tubular, 4-lobed, the lower lobe smaller; stamens 2, much exserted; capsule ovate, 2-celled, valves opening at top.

Gr. λεπτος, slender, ανδρια, stamens; alluding to the filaments and the style which are at length much longer than the tube of the corolla.

L. VIRGI'NICA. *Nutt.* Veronica Virginica. *L.*

Leaves verticillate; *stem* erect, smooth; *spikes* aggregated, terminal. A conspicuous plant arising 2—5 feet. Stem simple, straight, smooth, with whorls of lanceolate, acuminate, finely serrate leaves which are subpetiolate and glaucous beneath, and 4—6 in a whorl. Flowers numerous, nearly sessile, in long, terminal and verticillate-subterminal spikes. Corolla white, tubular, pubescent inside. Stamens and style twice as long as the corolla. July. Per. *Culver's Physic.*

17. GERA'RDIA.

Calyx cleft half-way down into 5 lobes or teeth; corolla subcampanulate, unequally 5-lobed, lobes mostly rounded; anthers villose; capsule 2-celled, dehiscent at top.

In honor of John Gerarde, an English botanist of the 16th century. Herbaceous, rarely suffruticose. Lvs. generally opposite. Fls. axillary.

* Flowers yellow.

1. G. QUERCIFO'LIA. *P.* G. glauca. *Eddy.*

Smooth; *stem* panicled; *leaves* petiolate, pinnatifid, the upper ones lanceolate, all paler beneath; *flowers* pedicelled, axillary, opposite. A very

ornamental and showy plant of the woods, well worthy a place in the flower garden. It has a tall, smooth, glaucous, branching stem 3—5 feet high. Leaves sinuate-pinnatifid; the upper ones only cut-dentate, all acute at each end, stalked, paler beneath. Flowers large and of a brilliant yellow, opposite and axillary, near the top of the stem, forming a loose spike. Corolla trumpet-shaped. The flowers resemble in form those of the foxglove, while the leaves may be likened to those of the oak. The whole plant turns black in drying, making but a shabby appearance in the herbarium. Aug. Per.
Oak-leaved Gerardia.

2. G. FLA'VA.

Pubescent; *stem* nearly simple; *leaves* sessile, lanceolate, entire or cut-dentate; *flowers* subsessile. Scarcely less elegant than the last, which it much resembles. Native of woods. Stem 2—3 feet high, erect, pubescent. Lower leaves variously pinnatifid, or cut and toothed; upper ones very entire or toothed, obtuse; all opposite and sessile. Flowers large, yellow, opposite, axillary, trumpet-shaped. This also with the next species, turns black in drying. Aug. Sept. Per. *Yellow Gerardia.*

3. G. PEDICULA'RIA.

Stem panicled, pubescent; *leaves* oblong, pinnatifid, the segments serrate; *calyx segments* leafy, cut-dentate. One of the most elegant species, found in woods and mountains. Stem tall and bushy, 2—3 feet high, covered with a scattered, woolly pubescence. Leaves numerous, pinnatifid with serrate lobes, opposite, on short, hairy stalks. Flowers large. Corolla trumpet-shaped, ye low, with roundish, spreading, leaflike segments. The leaves have the general appearance of those of the lousewort, or some of the ferns. Aug. Per. *Lousewort Gerardia.*

* * Flowers purple.

4. G. PURPU'REA.

Stem angular, much branched; *leaves* linear, narrow, acute; *flowers* subsessile, scattered; *calyx segments* subulate. Found in wet pastures and swamps. Stem slender, branching, erect, smooth, obtuse-angled, 1—2 feet high. Leaves entire, roughish, 8—15 lines long and about 2 lines wide. Flowers large, axillary, often opposite, purple, on very short stalks. Aug. Ann. *Purple Gerardia.*

5. G. MARI'TIMA.

Stem angular; *leaves* linear, fleshy, short, rather obtuse; *flowers* stalked; *calyx* truncate; upper segments of the *corolla* fringed. Native of salt marshes. This species resembles the foregoing, of which Pursh describes it as a variety. It is a smaller plant 6—12 inches in hight, and with smaller flowers. The leaves are shorter and thicker. The calyx segments are cut square off, not acute as in the preceding. Corolla purple. Flower stalks axillary and terminal. July—Sept. Ann. *Salt Marsh Gerardia.*

6. G. TENUIFO'LIA.

Branching; *leaves* linear; *peduncles* axillary, longer than the flowers; *calyx teeth* short, acute. A slender and delicate species, usually very branching, but I have specimens, gathered in various localities, Ms. and N. H., which are quite simple. Leaves about an inch long, very narrow (scarcely a line in width), entire, rough, obtuse. Flowers opposite, axillary, on slender stalks an inch or more in length. Corolla purple, spotted within, the border much spreading, smooth and nearly equal. Calyx teeth short and acute. Grows by roadsides and in sandy soils, 6—12 inches high. Aug. Sept. Ann.
Slender-leaved Gerardia.

18. RHINA'NTHUS.

Calyx 4-toothed, ventricose; corolla ringent, upper lip compressed; capsule 2-valved, compressed, obtuse.

Gr. ῥιν, a nose, and ανθος, a flower; because the upper lip of the ringent corolla is so compressed as to resemble the snout of some animal. Herbaceous. Lvs mostly opposite. Cor. tube nearly cylindric, as long as the cal., upper lip narrower, helmet-shaped; lower lip broader, deeply divided into 3 obtuse segments.

R. CRISTA-GALLI.

Upper lip of the *corolla* vaulted; *ca'yx* smooth; *leaves* lanceolate, serrate. Meadows and pastures. Stem a foot high, smooth, branching. Leaves opposite, nearly sessile, cordate-lanceolate, acutely serrate, rough. Flowers axillary, crowded into a leafy spike. Calyx inflated, contracted at the mouth, with 4 nearly equal teeth, and much shorter than the yellow, ringent corolla, but becoming very large after flowering. July. Ann. *Yellow-rattle.*

19. EUCHRO'MA.

Calyx ventricose, 2—4-cleft; corolla upper lip very long and linear, embracing the style and stamens; anthers linear, with unequal lobes, cohering in the form of an oblong disk.

Gr. ευ, good, and χρωμα, color; on account of the fine scarlet bracts. Herbaceous. Lvs. alternate. Fls. axillary, solitary. Caps. ovate, compressed, 2-celled. Seeds numerous, invested in a diaphanous, inflated aril.

E. COCCI'NEA. *Nutt.* Bastsia coccinea. *L.*

Leaves sessile, pinnatifid, with linear and divaricate segments; *bracts* about 3-cleft and colored at the summit, longer than the corolla; *calyx* 2-cleft, nearly equal with the corolla, segments retuse and emarginate. Wet meadows. A very beautiful plant, remarkable for its large, bright scarlet bracts. Stem angular, simple, 8—12 inches high. Leaves alternate, sessile, with about 2, long, linear segments on each side. Bracts crowded near the summit of the stem, in 3 segments, the middle one larger than the linear lateral ones. Flowers one in the axil of each bract. Calyx and corolla tubular, dull yellow, the former tinged with scarlet towards the tip. May. Jn. Per. *Painted-cup.*

20. BA'RTSIA.

Calyx 4-lobed, emarginate, mostly colored; corolla smaller than the calyx, the upper lip longer; capsule 2-celled; seeds angular.

Named by Linnæus, in honor of his friend John Batsch, M. D. Herbs with alternate leaves. Cor. ringent, upper lip concave, entire, lower in 3, equal, reflexed lobes. Anth. approximate under the upper lip.

B. PA'LLIDA.

Leaves alternate, linear, undivided, the upper ones lanceolate, the floral ones subovate, subdentate at the end, all 3-nerved; *calyx* with acute teeth. This hardy plant inhabits the alpine regions of the White Mts. in N. H., particularly the hights of Mt. Clinton, where it may be found in blossom in Aug. It is also a native of Siberia and Hudson's Bay. Stem about a foot high, furrowed, simple. Leaves alternate, sessile, smoothish, the lower ones linear, becoming broader towards the upper part of the stem where they are lanceolate

and all usually with but 3 nerves. Tuft of flowers at top of the stem. Bracts broader and shorter than the leaves, 5—7-nerved, with about 3 teeth at the end, of a pale straw-color, tipped with purple. Flowers straw-colored, nearly concealed by the bracts. Per. *Pale Bartsia.*

21. SCHWA'LBEA.

Calyx tubular, inflated, obliquely 4-cleft, upper division small, lower division large, emarginate or 2-toothed; corolla ringent, upper lip entire, arched, lower 3-lobed; seeds many, chaffy.

Named in honor of Schwalbe, a German botanist. Herbs with alternate leaves. Fls. in a terminal raceme. Caps. ovate, compressed, 2-celled, 2-valved, with a double partition. Seeds linear and winged.

S. AMERICA'NA.

Simple, pubescent; *leaves* lanceolate; *flowers* alternate, in a terminal raceme. In sandy fields and barrens. Stem 2 feet high, downy, square and simple. Leaves alternate, sessile, lanceolate, with a ciliated margin. Bracts ovate, acuminate. Flower stalks simple, alternate. Corolla dull purple or brownish yellow. June. Per. *Chaff-seed.*

22. PEDICULA'RIS.

Calyx ventricose, 2—5 cleft, the segments leafy, or sometimes obliquely truncate; corolla vaulted, upper lip compressed, emarginate; lower lip spreading, 3-lobed; capsule 2-celled, oblique, mucronate; seeds angular.

Lat. *pediculus*, a louse; probably from its efficacy in destroying that insect. Herbs. Lvs. opposite or alternate, often pinnatifid. Cal. seg. unequal, jagged. Cor. lower lip dilated, flat, in 3, deep seg. of which the middle one is narrowest. Caps. depressed, dissepiment contrary.

1. P. CANADE'NSIS.

Stem simple; *spike* somewhat leafy; galea of the *corolla* with 2 setaceous teeth; *calyx* truncated downwards; *capsule* acuminate. Grows in pastures and low grounds. Stem erect, a foot high. Leaves lanceolate, pinnatifid with crenate or dentate lobes, dark green. Spike short, terminal, hairy, with a few small leaves at the base. The flowers are nearly sessile. Calyx truncated in an oblique direction downwards. Corolla yellowish and purple; the upper lip is long, erect, forming a galea or helmet cut square off at the end, with a bristle-like tooth at each corner. Capsule prolonged into a lanceolate point ½ inch long. May—July. Per. *Canadian Lousewort.*

β. gladiata (P. gladiata *Mx.*); *capsule* prolongated into an ensiform point which is ½—1 inch in length. Plant rather taller.

2. P. PA'LLIDA. *P.* P. lanceolate. *Mx.*

Stem branching, smooth; *leaves* subopposite, lanceolate, crenate and dentate; upper lip of the *corolla* truncate, with roundish-ovate, foliaceous, dentate segments; *calyx* 2-cleft. A smaller species than the foregoing, found in alluvial woods, &c. Stem 1—2 feet in hight, smooth, with pubescent lines, nearly opposite leaves and a few axillary branches. Leaves about an inch wide and 3 or 4 times as long. Spikes terminal, 1—2 inches in length, with ovate-lanceolate bracts. Calyx and corolla smooth, the latter greenish yellow, an inch in length, with the galea somewhat emarginate at the end. Capsule short, broadly ovoid. Sept, Per. *Pale Lousewort.*

23. MELAMPY'RUM.

Calyx 4-cleft; upper lip of the corolla compressed, the margin folded back; lower lip grooved, trifid; capsule 2-celled, oblique, opening laterally, cells 2-seeded; seeds cylandric-oblong, smooth.

Gr. μελας, black, and πυρος, wheat; the grain resembles the wheat in form, but gives a singularly black color to the bread in which it is mixed. Herbs with opposite leaves. Fls in a terminal, leafy raceme. Cor. ringent, tube recurved. Caps. with the dissepiment contrary. Seeds cartilaginous.

M. AMERICA'NUM.

Leaves linear and lanceolate, the upper ones toothed at base; *flowers* axillary, distinct. Inhabits woods. Stem with opposite branches, 8—10 inches high, round, erect. Leaves opposite, sessile, lanceolate, the floral ones broader with setaceous teeth at base and tapering to an obtuse point. Flowers in the axils of the upper leaves, yellowish, slender, the corolla twice the length of the calyx. Capsules acute, declined, 4-seeded. Jl. Ann. *Cow Wheat.*

ORDER XCIII. VERBENACEÆ. *The Vervain Tribe.*

Cal.—Tubular, 4—5-toothed, inferior, persistent.
Cor.—Tubular, the limb bilabiate or irregularly 4—5-cleft, deciduous.
Sta.—4, didynamous, seldom equal, occasionally only 2.
Ova.—2—4-celled; ovules erect or pendulous, solitary or twin. *Style* 1.
Fr.—Drupaceous, baccate or dry, dividing into 2 or 4 1-seeded portions.
Sds.—With little or no albumen.

Herbs, shrubs or trees, the former chiefly natives of temperate regions and the latter of the tropics, where they are in some instances very large. The teak-wood (Tectona grandis), native of India, justly styled the "Oak of the East," is a timber tree of immense size and great durability, often attaining the hight of 100 feet. The wood contains silex. The medicinal properties of the tribe are little known or unimportant.

Genera.

Corolla funnel-form, limb 5-cleft, subequal.	*Verbena.* 1
Corolla bilabiate, upper lip smaller, emarginate.	*Phryma.* 2

1. VERBE'NA.

Calyx 5-toothed, with one of the teeth often truncate; corolla funnel form, limb 5-cleft, nearly equal; stamens 4 (rarely but 2); seeds 2—4, enclosed in a thin evanescent pericarp.

The name in Celtic is *ferfaen*, to remove stone; hence Eng. *vervain* and Lat. *verbena.* Herbs with opposite leaves. Fls. mostly spicate. Cor. tube twice as long as the cal. Fil. very short, incurved within the tube.

1. V. HASTA'TA.

Erect; *leaves* lanceolate, acuminate, incisely serrate, petiolate, the lower ones lobed or hastate; *spikes* erect, filiform, panicled; *flowers* tetrandrous. An erect, tall and elegant plant frequent by road sides and in low grounds. Stem 3—4 feet high, with paniculate, opposite branches above. Leaves rough in appearance, and to the touch, opposite, long pointed, finely serrate, the lower ones often somewhat hastate Flowers small, blue, arranged in long, close, imbricated spikes, which are somewhat fascicled at the summit of the stem, erect and parallel to each other. Seeds 4. Jl.—Sept. Per. *Blue Vervain.*

2. V. URTICIFO'LIA.

Erect, subpubescent; *leaves* ovate and ovate-lanceolate, serrate, acute, petiolate; *spikes* axillary and terminal, loose, filiform; *flowers* tetrandrous. About roadsides and rubbish. A weed of uninviting appearance, 2—3 feet high, with leaves resembling those of the nettle. It has long, slender, weak, green, divergent spikes remotely filled with small, white, distinct flowers. Seeds 4. July, Aug. Per. *Nettle-leaved Vervain.*

3. V. ANGUSTIFO'LIA. *M.* V. rugosa. *W.*

Erect, mostly simple; *leaves* lanceolate-linear, tapering to the base, remotely serrate, with furrowed veins; *spikes* filiform, solitary, axillary and terminal. A small, hairy species, found on rocky hills and in other dry soils, N. Y. Stem not more than a foot high, with narrow, rough leaves and slender spikes of deep blue flowers. July. Per. *Pigmy Vervain.*

4. V. AUBLE'TIA.—*Stem* weak, assurgent; *spikes* solitary, imbricate, long-pedunculate; divisions of the *corolla* emarginate; *leaves* oval, deeply serrate and divided, petiolate. Native at the South. A slender and delicate plant of the green-house, producing numerous, successive clusters of rose-colored or scarlet flowers. Stem square, viscidly pubescent, 1—2 feet high, with opposite branches and leaves. Leaves deeply cut and toothed, rhombic-oval, on short stalks. Flowers larger than others of the genus, in corymbose spikes. Bracts nearly as long as the calyx, narrow, permanent, downy as well as the calyx. May. Per *Rose Verbena.*

2. PHRY'MA.

Calyx cylindric, bilabiate, upper lip longer, 3-cleft, lower lip 2-toothed; corolla bilabiate, upper lip emarginate, much smaller than the 3-lobed lower one; seed solitary.

Meaning of the name unknown. Herbs with opposite leaves. Fls. opposite, spicate. Fruit deflexed. Cal. gibbous at base on the upper side, striate. Cor. ringent; tube long as cal., middle seg. of the lower lip most prominent

P. LEPTOSTA'CHYA.

Leaves stalked, ovate, serrate; *spikes* long and slender; *calyx* in fruit reflexed. Found in rocky woods. Stem 2—3 feet high. Leaves large, (3—6 inches long), thin and coarsely toothed, on short stalks. Flowers small, opposite, light purple, in very long and slender spikes, of which one is terminal, the rest opposite and axillary, each often with a pair of bracts below. After flowering the calyx closes upon the fruit and becomes reflexed backwards close to the stem. Hence the common name *lopseed.* The specific name refers to the *slender spikes.* Seeds solitary, rather large, invested with a thin, membranous capsule and enclosed in the matured calyx. July. August. Per. *Lopseed.*

ORDER XCIV. LABIATÆ. *The Labiate or Mint Tribe.*

Cal.—Tubular, regularly 5-toothed or cleft, or bilabiate, persistent.
Cor.—Bilabiate (rarely regular, 5-toothed), the upper lip bifid or entire, overlapping in æstivation the lower 3-cleft one.
Sta.—4, didynamous, or sometimes only 2, the upper pair being abortive or wanting, situated on the corolla tube. *Anth.* mostly 2-celled.
Ova.—Free, deeply 4-lobed, the single style arising from the base of the lobes.
Fr.—1—4 hard nuts or achenia.
Sds.—Erect, with little or no albumen. Embryo erect. Cotyledons flat.

A large and important order of herbs (rarely shrubby), with square stems and opposite, exstipulate leaves, abounding in receptacles of aromatic oil. Flowers in axillary or terminal verticillasters, almost always of the cyanic series, white, blue, red, &c. The species are chiefly natives of temperate regions, being most abundant between latitudes 40° and 50° of the northern hemisphere.

Properties. This well known family is universally pervaded by an aromatic, volatile oil and a bitter principle; the former rendering them eminently tonic, cordial and stomachic; the latter, where it prevails, febrifugal. The *pennyroyal, lavender, sage, hoarhound, thyme, spearmint, peppermint, horsemint, rosemary, &c., &c.*, plants whose qualities are too well known to require particular mention here, are all members of this useful family. Not one species is poisonous or even suspicious.

Conspectus of the Genera.

* Flowers diandrous.

Calyx	bilabiate.	Connectile erect, short.	Cor. blue.	Bracts whitish.	*Blephilia.*	7
				Bracts green.	*Hedeoma.*	18
			Corolla yellow.		*Collinsonia.*	16
		Connectile transverse, long; anthers dimidiate.			*Salvia.*	8
		Corolla bilabiate..	Upper lip emarginate.	Herbs.	*Cunila.*	17
				Shrubs.	*Rosmarinus.*	9
			Upper lip linear, embracing the fil.		*Monarda.*	6
	subequal.	Corolla subregular, 4-lobed.			*Lycopus.*	5

* * Flowers didynamous.

Cal. bilabiate.	Tube of corolla exserted.	Stamens ascending	Lips of calyx toothed.	Filaments simple.	*Melissa.*	20
				Filaments forked.	*Prunella.*	22
			Lips of the calyx entire.		*Scutellaria.*	21
		Stamens very long, arching the 5-cleft limb of cor.			*Trichostema.*	33
	Tube of the cor. scarcely longer than cal.			Stamens scarcely exsert.	*Thymus.*	13
				Stamens exserted.	*Majorana.*	12
Cal. subequally 5-toothed and the teeth unarmed or mucronate.	Stamens erect or divergent	Corolla bilabiate...	Bracts green...	Flowers spicate.	Cal. 15-nerved. equal.	*Hyssopus.*	15
					Calyx 10-nerved. oblique.	*Lophanthus.*	25
				Fls. capitate, involucrate.		*Satureja.*	14
			Bracts colored.			*Pycnanthemum.*	10
						Origanum.	11
		Corolla limb of 4 subequal lobes, one of them emarg.				*Mentha.*	3
		Corolla limb of 5 equal lobes.				*Isanthus.*	4
	Stamens ascending and	Leaves crenate.	Anth. not cruciate	Calyx 5-nerved.		*Lamium.*	27
				Calyx 15-nerved.		*Nepeta.*	23
			Anthers forming 2 crosses.			*Glechoma.*	24
		included beneath the upper lip..		Plants glabrous.		*Physostegia.*	26
			Lvs sharply serrate	Plants hairy.		*Ballota.*	32
			Lvs. entire, lance-linear and elliptic.			*Micromeria.*	19
		exserted through the fissure of the upper lip of cor.				*Teucrium.*	34
			Upper lip of the corolla 2-lobed.			*Lavendula.*	2
	Stamens declinate....		Upper lip of the corolla 4-cleft.			*Ocimum.*	1
	the teeth spinescent...	Leaves undivided...	Lower lip of the cor. with 2 lateral teeth.			*Galeopsis.*	29
			Low. lip of cor. with lateral lobes reflexed.			*Stachys.*	30
		Leaves mostly 3-lobed.				*Leonurus.*	28
Calyx 10-toothed, the alternate teeth shorter.						*Marrubium.*	31

Tribe 1. OCIMOIDEÆ.*

Corolla subbilabiate, the 4 upper lobes nearly equal, the lower one declinate, flat or concave, carinate or saccate. Stamens 4, declined.

1. OCIMUM.

Upper lip of calyx orbicular, lower 4-fid; corolla resupinate, one lip 4-cleft, the other undivided; exterior filaments with a process at their base.

Gr. ὀζω, to smell; on account of the powerful scent of the plants.

* In distributing our genera of this order into Tribes, as well as in their nomenclature, I have mostly conformed to the views of Mr Bentham, as expressed in his elaborate and excellent work on the Labiatæ. This arrangement will greatly aid the student in his researches, wherever he may find the foregoing *conspectus* insufficient.

O. BASI'LICUM.—*Leaves* smooth, ovate-oblong, subdentate, petiolate; *calyx* ciliate. An exotic from Persia, cultivated. Plant about a foot high, with peculiarly smooth and soft leaves variously colored, exhaling a delightful odor. Stem retrorsely pubescent above, branched. Flowers white, in simple, terminal racemes. Jl., Aug. Ann. *Royal Ocimum or Sweet Basil.*

2. LAVA'NDULA.

Calyx ovoid-cylindric, with 5 short teeth, the upper one often largest; corolla upper lip 2-lobed, lower 3-lobed; tube exserted; stamens included.

Lat. *lavare*, to wash. The use of the distilled water of this plant is well known. Cor. lobes nearly equal. Fil. smooth, not toothed. Disk concave with 4 fleshy scales on the margin.

L. SPICA.—*Leaves* linear-oblanceolate, tapering to the base, sessile, revolute at the edge, the upper ones linear-lanceolate, the highest shorter than the calyx; *spike* interrupted; *bracts* subulate. Plant 12—18 inches high, suffruticose, branching from the base. Leaves crowded at the base of the branches, clothed with a whitish down. Calyx villose. Corolla much exserted and of a lilac color. The plant is well known as an aromatic of a delightful fragrance. It is stimulant and tonic, and the oil extracted by distillation enters into many compositions in medicine. Cultivated in gardens. July. Per. *Lavender.*

TRIBE 2. MENTHOIDEA.

Corolla somewhat campanulate or funnel-form; tube scarcely exserted, limb subequally 4—5-lobed. Stamens 4, sometimes 2, distant, straight, diverging.

3. MENTHA.

Corolla nearly regular, 4-cleft, the broadest segment emarginate; stamens 4, straight, distant.

The old Greek name, from Mintha, the fabulous daughter of Cocytus, once transformed into the plant which bears her name. Cal. tubular, regular, 5-toothed. Cor. straight, funnel-shaped, a little longer than cal., upper lobe broadest, notched. Fil. naked. Anth. 2-lobed, with 2 parallel cells. Stig. divided into 2 acute, spreading seg. Ach. 4.

1. M. CANADE'NSIS. *Benth.* M. borealis. *Mx.*

Ascending, pubescent; *leaves* petiolate, lanceolate, serrate, acute at each end; *flowers* in axillary cymes; *stamens* generally exserted. An herbaceous, grayish plant, 1—2 feet high, growing in muddy situations. The stem is square and usually branched, the angles beset with reversed hairs. Leaves serrate, on opposite, downy footstalks, and punctate with resinous dots at each end. Flowers apparently in whorls, pale purple, usually distinguished by the projecting stamens which are sometimes twice as long as the corollas. Calyx hairy. Aromatic like the other species. Jn., Jl. Per. *Horsemint.*

β. (M. Canadensis. *L.*) *stamens* equalling the corolla.

2. M. VIRIDIS.

Leaves subsessile, oblong-lanceolate, acute, incisely serrate; *bracts* setaceous, and, with the teeth of the calyx, somewhat hairy; *spikes* slender, interrupted, attenuate above. A well known plant, highly esteemed for its agreeable aromatic properties. It grows in wet soils, rapidly spreading by its creeping roots, with erect, branching, 4-angled stalks, 1—2 feet high. The spikes are

somewhat panicled, long, composed of distinct, axillary cymes, apparently whorled, a little remote from each other. Peduncles smooth, round, shining. Corollas pale purple. Styles much exserted. Aug. Per. *Spearmint.*

3. M. PIPERI'TA.

Leaves smooth, ovate-lanceolate, serrate, petiolate; *bracts* lanceolate; *calyx* quite smooth at base, punctate. This species, introduced from Europe, has become naturalized in this country, growing in wet places, and cultivated in gardens. It has a more penetrating taste and stronger smell than the other species, pungent to the tongue followed by a sensation of coldness. The essence of peppermint is a well known medicine, acting as a cordial, used in flatulency, nausea, &c It has a purplish stem 2—3 feet high, with scattered, deflexed hairs. Leaves sharply serrate, dark green. Corolla purplish. Aug. Per. *Peppermint.*

4. ISA'NTHUS.

Calyx subcampanulate; corolla 5 parted, tube straight and narrow, segments of the border ovate and equal; stamens subequal; stigma linear, recurved.

Gr. ισος, equal, ανθος, flower; from the regularity of the flowers, a character very rare among the Labiatæ.

1. CŒRU'LEUS. *Mx.*

Viscid, hairy; *leaves* oval-lanceolate, acute at both ends, 3-nerved; *peduncles* 1—2-flowered. A branching, leafy herb, in dry fields, with the aspect of the pennyroyal. Stem rounded, slender, 12—18 inches high, with branches and leaves opposite. Leaves an inch or less in length, and a fourth as wide, distinctly tripli-nerved. Flowers numerous, blue, with included stamens. Calyx leaves lanceolate, longer than the tube. July. Per. *Blue Gentain.*

5. LYCO'PUS.

Corolla subregular, 4-cleft, upper segment broader and emarginate; stamens 2, distant, simple; achenia 4.

Gr. λυκος, a wolf, πους, foot Why so named we cannot tell. Cal. tubular, 4—5-cleft. Cor. tube as long as the cal. Stam. diverging. Style straight, as long as the stam. Ach. obliquely truncate at apex.

1. L. SINUA'TUS. *Ell.* L. Americanus. *Muh.* L. Europæus. *Mx.*

Leaves oblong-lanceolate, sinuate-dentate, lower ones incised; teeth of the *calyx* acuminate-spinescent; *stem* square, 1—2 feet high; *flowers* small, white, many in a whorl. A perennial plant, widely diffused throughout the U. States, growing in damp grounds. In habits and general appearance it resembles the Menthæ, but is sufficiently distinguished by the number of stamens, form of the flattened triquetrous achenia, and its being inodorous. Stem sharply 4-angled, the sides concave, 1—2 feet high. Lower leaves deeply and pinnatifidly toothed. Verticils dense. Calyx teeth longer than the achenia. It dyes a permanent black. Aug. Per. *Water Hoarhound.*

2. L. VIRGI'NICUS.

Leaves broad-lanceolate, serrate, tapering and entire at the base; *calyx teeth* spineless, usually 4, shorter than the achenia. A plant as widely diffused as the preceding, growing in wet soils. Stem smooth, obtusely 4-angled with the sides concave, 12—18 inches high, usually simple, bearing small whorls of minute, purplish flowers. Leaves with coarse, tooth like serratures, sessile. The whole plant often changes to purple. It is reputed a remedy for blood-spitting. July, Aug. Per. *Virginia Water Hoarhound. Bugle-weed.*

Tribe 3. MONARDEÆ.

Corolla bilabiate; tube exserted. Stamens 2 fertile, ascending, the upper pair abortive; anthers linear, with the two cells contiguous, or halved with the 2 cells widely separated on opposite ends of a long, transverse connectile.

6. MONA'RDA.

Corolla ringent, tubular, upper lip linear, involving the filament; stamens 2, mostly exserted from the upper lip.

Name in honor of Monardes, a spanish botanist of the 16th century. Cal. elongated, cylindric, striate, sub-equally 5-toothed. Upper lip of cor. lance-linear, lower lip reflexed, 3-lobed, the middle lobe narrower; tube slender, mostly exserted. Anth. 2-celled, cells divaricate at base, connate at apex.

1. M. DI'DYMA.

Stem acutely 4-angled; *leaves* broadly ovate, acuminate, somewhat rough and villous, on short petioles, midribs and veins hairy beneath; *flowers* in terminal, often proliferous heads; *bracts* colored. A handsome, fragrant plant, 2—3 feet high, with crimson or scarlet flowers. Stem mostly branching. Leaves 2—5 inches long, very broad at base, often cordate, serrate, with scattered hairs above and prominent, hairy veins beneath. Flowers in heads which are often proliferous, with large, ovate lanceolate bracts tinged with the same color as the corollas. Calyx colored. Corollas large and showy. Styles 4, 2 of which are minute and abortive; hence the specific name. A beautiful plant in cultivation. Swamps. July. Aug. Per. *Mountain Mint.*

2. M. FISTULO'SA. *L.*

Leaves ovate-lanceolate, acute or acuminate, petiolate, more or less pubescent; *heads of flowers* terminal, few, but many-flowered; *bracts* sessile, *calyx* slightly curved with the throat hirsute. A handsome, variable plant, growing in hedges, thickets, rocky banks, &c., most common in N. York. The stem is 2—3 feet high, quadrangular with the sides somewhat concave, hollow in various degress, nearly smooth or pubescent above, simple or with a few opposite branches. Leaves obtuse at base, ovate or oblong-lanceolate, mostly acuminate, acutely serrate, nearly smooth, 2—4 inches long and on petioles one fifth their length. Flowers in involucrate, terminal heads, 20—50 in a head. Outer bracts leafy, often partially colored. Calyx slender, one half inch in length. Corolla much exserted, varying from greenish white and pale purple to blue, the upper lip long and linear, enfolding the 2 stamens, which, with the style are somewhat exserted at its end. July, Aug. Per.

α. Stem simple, hollow; heads simple or proliferous; corolla pale yellow.

β (M. allophylla. *Mx.*); stem branched, hollow, or solid with pith; leaves oblong-lanceolate; heads simple; bracts partially colored; corolla pale blue.

γ. (M. clinopodia. *L*); stem solid; leaves tapering at base, remotely serrate; heads simple; calyx short; corolla pale purple.

7. BLEPHI'LIA.

Calyx 13-nerved, bilabiate, upper lip 3-toothed, lower lip shorter, 2-toothed, the teeth setaceous; corolla bilabiate, upper lip short, erect, oblong, obtuse, entire; lower lip of 3 unequal, spreading lobes, the lateral ones orbicular; stamens 2, fertile, ascending, exserted.

Gr. βλεφαρις, the eye-lash; probably referring to the ciliate bracts.

B. HIRSU'TA. *Raf.* Monarda hirsuta. *P.* M. ciliata. *Mx.*

Whole plant hirsute; *leaves* ovate-lanceolate, acuminate, serrate, petiolate; *flowers* in axillary verticillasters; *bracts* colored, shorter than the flowers, oblong, acuminate. In damp woods, rare. Stem 1—2 feet high, diffusely branching, roughly pubescent. Petiole one fourth to one half inch long, leaves 3 or 4 times as long, somewhat rounded at base. Flowers small, forming several dense whorls near the ends of each branch. Corolla scarcely half an inch long, pale purple with spots of a deeper hue. Style longer than stamens, or corolla. June, July. Per. *Hairy Blephilia.*

8. SA'LVIA.

Corolla ringent; stamens 2; connectile transversely articulated to the filament, supporting at each end a cell of the dimidiate anther; achenia 4.

Lat. *salvia*, from salveo, to be well; probably for its salutary qualities. A large genus of which but few species are native. Cal. tubular, striate, 2-lipped, the upper lip 2—3-toothed, lower lip divided Upper lip of cor. straight or falcate, lower 3-cleft, middle segment largest, emarginate. The transverse connectile constitutes the essential character.

1. S. LYRA'TA.

Radical leaves lyrate, erosely dentate; *upper lip of the corolla* very short, straight. Stem erect, quadrangular, nearly leafless, 1—2 feet high, branching above and covered with hairs pointing downwards. Radical leaves oblong, lyrate or sinuate-pinnatifid, petiolate. Cauline leaves but 1—2 pairs, just below the raceme. Flowers in whorls of about 6, distant, constituting a long, interrupted raceme. Corolla blue, the tube much exserted. Native of shady woods. May, June. Per. *Wild Sage.*

2. S. OFFICINA'LIS.—*Leaves* ovate-lanceolate, crenulate, rugose; *whorls* few-flowered; *calyx* mucronate; *upper lip of the corolla* as long as the lower and somewhat vaulted. A well known garden shrub, with a shrubby stem, rugose leaves of a dull green color and an aromatic fragrance. Flowers in whorls forming a spike. Corolla ringent, blue, with a lengthened tube and viscid calyx, somewhat brown. Native in the south of Europe. Very useful in domestic economy and medicine. July. Per. *Common Sage.*

3. S. SCLARY.—*Leaves* oblong, heart-shaped, rugose, villous, serrate; *bracts* colored, concave, longer than the calyx. A strong-scented exotic, 1—3 feet high, with viscid leaves as large as the hand. The flowers and bracts are variegated with pale purple and yellowish white, in whorled spikes. Calyx with spinous teeth. Native in Italy. Bien. *Clarry.*

9. ROSMARI'NUS.

Corolla bilabiate, upper lip 2-parted; filaments 2, fertile, elongated, ascending, having a tooth on the side.

An ancient Latin name, compounded of *ros*, dew, and *marinus*, of the sea. Cor lower lip reflexed, in 3 divisions, of which the middle is larger. Fil. inclining towards the upper lip, which they exceed in length.

R. OFFICINA'LIS.—*Leaves* sessile, linear, margins revolute. An erect, evergreen shrub, 4 feet high, much branched Leaves opposite, obtuse, linear-oblong, entire, smooth, dark green and shining above, downy and sometimes whitish beneath. Flowers axillary and terminal, of a bright blue color, having, like the leaves, a strong aromatic fragrance like camphor. It yields by distillation a large proportion of fragrant oil. *Rosemary.*

Tribe 4. SATUREINEÆ.

Calyx 5-toothed and equal, or bilabiate with the upper lip trifid and the lower bifid. Corolla subbilabiate, upper lip erect, flat, entire or bifid, lower spreading, trifid, lobes subequal; tube about as long as the calyx. Stamens 2—4, distant, straight, diverging.

10. PYCNA'NTHEMUM.

Heads surrounded by an involucre of many bracts; calyx tubular, striate; upper lip of the corolla mostly entire; stamens distant, 2 as long as the upper lip, 2 shorter.

Gr. πυκνος, dense, and ανθος, a flower; the flowers of this genus are in close heads. Lower lip of cor. trifid, the middle lobe longest. Anth. with parallel cells.

* Stamens exserted.

1. P. INCA'NUM. *Mx.* Clinopodium incanum. *Willd.*

Leaves oblong-ovate, acute, subserrate, with short petioles and hoary tomentum; *heads of flowers* compound, terminal and lateral, pedunculate; *bracts* subulate. Grows in rocky woods and hills. Stem 2 feet high, obtusely 4-angled, erect, and, like the rest of the plant, covered with soft, whitish down. Leaves whitish beneath. Flowers pale red with purple spots, on white, tomentose peduncles, in dense heads, and with numerous bracts, of which the inner ones are setaceous, bearded at the end; the outer ones are lanceolate. Plant aromatic. July, Aug. Per. *Wild Basil.*

2. P. ARISTA'TUM. *Mx.*

Leaves lance-ovate, subserrate, with very short stalks, whitish; *verticils* and *terminal head* sessile; *bracts* awned. Native of dry woods. Stem 1—3 feet high, downy, erect. Leaves an inch long, punctate, nearly sessile, the upper ones a little canescent with down. Flowers white, small, in numerous, compound, dense, hoary, terminal, sessile whorls and heads. Aromatic—tastes like pennyroyal. July, Aug. Per *Wild Basil.*

3. P. LINIFO'LIUM. *P.* Brachystemum Virginicum. *Mx.*

Stem straight, smooth; *branches* trichotomous, fastigiate; *leaves* linear, very entire, 3-nerved, smooth; *heads* terminal, dense, in a fasciculate corymb. An erect plant with fastigiate branches, a foot and a half high, growing in exsiccated swamps, &c. Like both the above species it tastes and smells strongly like pennyroyal. Stem often purplish, slightly 4-angled, corymbose at the summit. Leaves very narrow, entire, smooth and punctate, with fascicles of smaller ones in the axils. Flowers small, white, in numerous, small, roundish heads, mostly terminal, and with imbricated bracts. Aug. Per. *Virginian Thyme.*

* * Stamens included.

4. P. VERTICILLA'TUM. *Mx.* P. lanceolatum. *P.*

Stem straight, corymbosely branched, pubescent on the angles; *leaves* subsessile, ovate-lanceolate and linear-lanceolate, feather-veined, entire; *verticils* sessile, fasciculate-corymbed; *bracts* linear-lanceolate, acuminate; *stamens* exserted. This species much resembles the preceding, but is distinct in several important characters. Grows in dry woods and hills. Stem 2 or more feet high, square, with obtuse angles, somewhat scabrous. Branches corymbed, downy above. Leaves varying in width from one sixth to one half of their length. Flowers collected in dense, canescent heads. Corolla purplish white with darker spots. Aug. Per. *Whorled Pycnanthemum.*

5. P. MU'TICUM.

Stem pubescent, paniculate-branching above; *leaves* ovate-lanceolate, subdentate, sessile, nearly smooth; *heads* terminal; *bracts* ovate-lanceolate, acuminate, awnless; *stamens* included. Found in woods and dry hills. Stem 2 feet high, square, with larger opposite leaves and white flowers. Leaves large, the width a third of the length, entire or denticulate. Heads mostly terminal, and with the bracts and upper leaves, whitish pubescent. Corolla tinged with purple, with spots of a deeper hue. Aug. Per. *Awnless Pyc.*

11. ORIGA'NUM.

Flowers collected into dense clusters, imbricated with bracts; upper lip of the corolla erect, flat, emarginate, lower lip with 3 nearly equal segments.

Gr. ορος a mountain, and γανος, joy. These pretty, fragrant plants may well be said to be the joy of the places where they grow. Invol. of many imbricated, ovate, colored leaves, one under each flower, longer than the ovoid-tubular, subregular calyx. Cor. ringent, tube equal to the calyx. Fil. long as cor.

O. VULGA'RE.

Leaves ovate, entire, hirsute, petiolate; *spikes* roundish, panicled, fasciculate, smooth, erect; *bracts* ovate, longer than the calyx, colored. Grows in fields and thickets. Stem 12—18 inches high, purple, leafy, branching above. Leaves a very little serrate, opposite, hairy, sprinkled with resinous dots, paler beneath. Petioles hairy one fourth as long as the leaves. Bracts tinged with purple. Flowers purplish white. The plant has a highly aromatic taste. July, Aug. Per. *Wild Marjoram.*

12. MAJORA'NA.

Upper lip of the calyx flat, contracted and involute at base; lower lip very small; corolla tube scarcely exserted, upper lip emarginate, lower spreading, subequally 3-lobed; stamens exserted, distant.

Name derived from the Arabic. European herbs. Flowers in dense spikelets, imbricated with bracts. Cal. and cor. somewhat 2-lipped. Anth. 2-celled.

M. HORTE'NSIS.—*Mœnch.* (Origanum Majorana. *P.*) *Leaves* oval or obovate, obtuse, entire, petiolate, hoary-pubescent; *spikes* roundish, compact, pedunculate, clustered at the end of the branches; *bracts* roundish. Native of Portugal, cultivated in gardens It has a pleasant aromatic flavor, and is employed in various ways as a *seasoning*. Plant soft-downy, a foot high. Flowers pink-colored. July, Aug. Per. *Sweet Marjoram.*

13. THYMUS.

Flowers capitate or verticillate; calyx subcampanulate, bilabiate, 10-ribbed, the throat closed with hairs; upper lip of the corolla flat, emarginate, shorter than the lower.

Gr. θυμος, courage; on account of the smell which revives the spirits of animals. Cal. upper lip trifid, lower bifid. Cor. lower lip spreading, 3-lobed, the middle lobe broadest.

1. T. VULGA'RIS —*Stems* procumbent at base, erect; *leaves* revolute at the sides, oblong-ovate and lanceolate; *verticils* in terminal, leafy spikes. Native of S. Europe and cultivated for culinary purposes. Stems suffruticose, numerous, branched, 6—10 inches high. It is highly aromatic, as well as the other species, and is peculiarly attractive to bees. Blossoms in summer. *Garden Thyme.*

2. T. SERPY'LLUS.

Stems decumbent; *leaves* flat, elliptical, obtuse, ciliate at base; *flowers* capitate. An aromatic plant, similar to the preceding, but milder and rather more pleasantly flavored. Stems suffruticose, wiry, slender and wavy, with leafy, downy and ascending branches, each terminating in a small, dense, oblong head of purple flowers, much frequented by bees. Leaves entire, petiolate, punctate, smoothish, ciliate. Corolla purple, spotted. June. Cultivated and naturalized. *Wild Thyme. Mother of Thyme.*

14. SATURE'JA.

Calyx tubular, 10-nerved; segments of the bilabiate corolla nearly equal; stamens diverging, scarcely exserted.

Arabic *satur*, the general name for labiate plants. Upper lip of cor. erect, flat; lower lip spreading, 3-lobed, lobes nearly equal.

S. HORTE'NSIS.—*Stem* branching; *leaves* linear-oblong, entire, acute at the end; *peduncles* axillary, cymose. Native of Italy. Cultivated as a culinary aromatic. Stem branching and bushy, a foot and a half high, woody at base, frequently changing to purple. Leaves numerous, small and narrow, with axillary cymes of pink-colored flowers. Calyx about as long as the corolla. July, Aug. Per. *Summer Savory.*

15. HYSSO'PUS.

Upper lip of the corolla erect, flat, emarginate, lower lip 3-parted, the middle segment largest, tube about as long as the calyx; stamens exserted, diverging.

Hebrew *ezob*; Arabic *azzof*; Eng. *hyssop*. It is uncertain to what plant the ancient name was applied. Cal. tubular, 15-nerved, equally 5-toothed; throat naked. Cor. bilabiate, lower lip in 3 segments of which the middle one is longest and crenate, obcordate. Anth. 2-celled; cells linear, divaricate.

H. OFFICINA'LIS.—*Leaves* linear-lanceolate, acute, entire, sessile; *calyx teeth* erect; *flowers* in racemose, secund verticils, middle division of the corolla 2-lobed, entire. The common hyssop is a native of S. Europe, often met with in our gardens, being cultivated for its reputed medicinal properties. It is a handsome plant, growing in tufts, 2 feet high, with delicate foliage and bright blue flowers. July. Per. *Hyssop.*

16. COLLINSO'NIA.

Corolla exserted, campanulate-ringent, upper lip in 4 subequal lobes, lower lip longer, declined, fimbriate; stamens 2, (rarely 3) much exserted, divergent.

Name in honor of John Collinson, an English botanist. Cal. ovoid, bilabiate, about 10 nerved; upper lip truncate, 3-toothed, lower lip bifid. Anth. 2-celled, cells divaricate.

C. CANADE'NSIS.

Leaves ovate, acuminate, coarsely serrate, petiolate, glabrous; *teeth of the calyx* subulate, shorter than the tube; *racemes* paniculate, terminal. A tall herb with large, yellow leaves. Stem 4-sided, 3—4-feet high, smooth or a little pubescent. Leaves thin, 6—8 inches long and 3—4 wide. Flowers in a large, compound raceme; with opposite branches and pedicels. Corolla greenish yellow, the lower lip elongated and fringed. Style and stamens very long. Flowering in summer. Woods and fields. Per. *Horse Balm.*

17. CUNI'LA.

Calyx 10 nerved, equally 5-toothed, throat densely villose, upper lip of corolla flat, emarginate; stamens 2, erect, exserted, distant.

Gr. κονιλη, the ancient Roman name for pennyroyal. Cal. tubular, cylindrical. Cor. bilabiate, lower lip spreading, 3-lobed, the middle lobe often the largest and emarginate. Anth. 2-celled; cells parallel or at length divergent at base.

C. MARIA'NA.

Leaves ovate, serrate, subsessile; *cymes* pedunculate, corymbose, axillary and terminal. Grows on rocks and in dry woods, N. Y. Stem 4-angled, mostly purple, branching, smoothish, 1—2 feet high. Leaves small, nearly smooth, roundish or subcordate at base, tapering to a point and punctate with pellucid dots. Flowers with subulate bracts at the base of the 3-forked pedicels. Calyx punctate. Corolla nearly twice as long as the calyx, pubescent, pale red. Stamens and style much exserted, of the same hue as the corolla. The herb is delightfully fragrant, and used in febrifugal infusions. July—Sept. Per. *Dittany.*

TRIBE 5. MELISSINEÆ.

Calyx bilabiate: corolla bilabiate: upper lip straight, lower lip spreading, cleft into 3 flat lobes, of which the middle one is often broadest. Stamens 4, sometimes 2, ascending.

18. HEDEO'MA.

Calyx gibbous beneath at base, 13-nerved, throat hairy; upper lip of corolla erect, flat, lower lip spreading, 3-lobed; stamens 2, fertile, ascending.

Gr. ἡδεια, sweet or agreeable, οσμη, smell; on account of the fragrance. Cal. ovoid, bilabiate, upper lip 3-toothed, lower lip bifid, about as large as the corolla. Anth. 2-celled; cells diverging.

H. PULEGIOI'DES.

Leaves oblong, few-toothed; *flowers* axillary, whorled. A small, strong-scented herb, held in high repute in the domestic *materia medica.* Stem erect, branching, half a foot high. Leaves opposite with 1—2 teeth each side, on very short petioles, smooth on the upper surface, roughish beneath. Calyx ciliate, 2 lower divisions spined. Abundant in dry pastures, and flowers in summer. Ann. *Pennyroyal.*

19. MICROME'RIA.

Calyx 13 (rarely 15)-nerved, 5-toothed, nearly equal; corolla sub-bilabiate, tube exserted, upper lip bifidly emarginate, lower subequally 3-lobed; stamens ascending, the upper pair shorter.

Gr. μικρος, small or obscure, μερος, division; on account of the slightly 2-lipped calyx and corolla.

M. GLABE'LLA. *Benth.* Cunila. *Mx.* Hedeoma glabra. *Nutt.*

Glabrous; *stem* branching above, and mostly surculose at base; *leaves* entire, those of the suckers elliptic-ovate, of the stem linear-oblong, obtuse; *verticillasters* about 6-flowered. A delicate little herb nearly or quite smooth, growing on lime-stone rocks near the base of Niagara Falls. It has the general aspect and fragrance of pennyroyal. Stem erect (prostrate at base), 4-angled, slender, 6—10 inches high. Suckers at the base often numerous and several inches in length, with leaves about 3 lines long, and 2 lines wide, brownish purple beneath. Stem leaves an inch or less long, very narrow, the lowest sometimes with a few teeth. Flowers somewhat regular, on pedicels ½ inch long, with linear bracts at the base. Corolla pale purple. Stamens 4, the upper pair much the shortest, all antheriferous. Jl., Aug. Per.

20. MELI'SSA.

Calyx 13 nerved, flattish above, the upper lip 3-toothed, lower bifid; upper lip of the corolla erect, flattish, lower lip spreading, 3-lobed, the middle lobe mostly broadest. Stamens ascending.

This is the Gr. name of the bee, from μελ, honey; which is sought in these flowers by bees with avidity. Cal and cor. bilabiate. Stam. mostly approximate in pairs at apex. Anth. 2-celled, cells distinct, parallel, finally diverging. Connectile often thickened.

1. M. OFFICINA'LIS.—Pubescent; *stem* erect, branching; *flowers* in dimidiate verticils, subsessile; *leaves* ovate, acute, coarsely crenate-serrate, rugose; *bracts* few, ovate lanceolate, petiolate. A well known garden plant, native of S. Europe. Stem about a foot high. Flowers white or yellowish. The plant is a stomachic and diuretic, generally administered in the form of tea. For medicinal use it should be cut before flowering which occurs in June and after. *Balm.*

2. M. CLINOPO'DIUM. *Benth.* Clinopodium valgare. *L.*

Villose; *leaves* ovate, subserrate; *verticils* many-flowered, hairy; *bracts* numerous, subulate. Low woods, &c. A common plant, 1—2 feet high. Stem square, simple or sparingly branched, and, as well as the whole plant, clothed with a whitish wool. Leaves petiolate, tapering to an obtuse point, pale, with whitish down beneath. Flowers purplish, in very hairy, mostly terminal whorls or heads. Peduncles cymosely branched, short. Involucre of narrow and bristle-like bracts, about equalling the hairy, subulate calyx teeth. July. Per. *Wild Basil.*

TRIBE 6. SCUTELLARINEÆ.

Calyx bilabiate, upper lip truncate. Corolla bilobiate, upper lip vaulted, tube ascending, exserted. Stamens 4, ascending beneath the upper lip of the corolla.

21. SCUTELLA'RIA.

Calyx campanulate, bilabiate, lips entire, the upper one appendaged on the back and closed after flowering; corolla bilabiate, upper lip vaulted, tube much exserted.

Lat. *scutella*, a small vessel, from the figure of the calyx, which may be likened to a cup with a handle. But it still more resembles a helmet with the vizor raised. Cor. ringent; upper lip concave, in 3 seg., the middle one cleft;

lower lip broader, in 3 shallow lobes. Tube ascending from the base. Stam. ascending. Anth. approximate in pairs under the upper lip, 2-celled.

1. S. LATERIFLO'RA.

Stem branching, nearly glabrous; *leaves* ovate-lanceolate, acuminate, serrate, petiolate; *racemes* lateral, axillary, leafy. Meadows and ditches. Stem square, 1—2 feet high, very branching. Leaves opposite, rounded at base, acuminate or acute, coarsely serrate, on petioles an inch in length. Racemes opposite, axillary, somewhat one-sided, on long stalks, and consisting of numerous small, blue flowers intermixed with small leaves. The English name is due to the singular form of the calyx, which after flowering, closes upon the seeds like a cap or vizor. July, Aug. Per. *Virginian Scull-cap.*

2. S. INTEGRIFO'LIA.

Stem erect, nearly simple, and, with the whole plant, densely pubescent; *leaves* ovate-lanceolate and linear-lanceolate, tapering to the base, subacute, entire, subsessile; *racemes* loose, leafy; *flowers* large. Grows on dry hills. Stem 1—2 feet high, with large blue flowers in terminal racemes. The leaves vary in breadth and margin, the lowest being sometimes ovate and crenate. July. Per. *Entire-leaved Scull-cap.*

3. S. GALERICULA'TA.

Stem erect, simple or branched; *leaves* lanceolate-cordate, remotely crenate-serrate; *flowers* axillary, solitary. Meadows and ditches. The whole plant glabrous. Stem square, 12—18 inches high. Leaves truncate-cordate at base and acutish at apex, scarcely petiolate, 1½ inch in length, ½ inch wide. Flowers much larger than the preceding, rarely more than 1 from the same axle, with a vizor-like calyx like that of the last. Corolla an inch in length, blue. July. *Common Scull-cap.*

22. PRUNE'LLA.

Calyx about 10-nerved, upper lip dilated, truncate, with 3 short teeth, lower lip with 2 lanceolate teeth; filaments forked, one point of the fork bearing the anther.

A name of German origin. Cal. campanulate, bilabiate. Cor. ringent; tube short, cylindric, the upper lip concave, entire, inflated, lower lip reflected, 3-lobed. Anth. approximate in pairs beneath the upper lip, 2-celled; cells divaricate.

P. VULGA'RIS.

Stem ascending, simple; *leaves* oblong-ovate, toothed, petiolate; *upper lip of corolla* truncate, with 3 awns. A very common plant sometimes called blue-curls, found in meadows and low grounds. The stem is nearly a foot high, obtusely 4-angled, hairy, simple or slightly branched. Leaves few, opposite, slightly toothed, the stalks gradually becoming shorter from the lower to the upper pair which are sessile. Flowers blue, in a large ovate spike of dense verticils. Bracts imbricated, reniform, 2 beneath each verticil. Flowering all summer. Per. *Self-heal.*

TRIBE 7. NEPETEÆ.

Calyx oblique, upper teeth longer. Corolla bilabiate, upper lip vaulted, lower spreading, throat mostly inflated. Stamens ascending or diverging, the upper pair longer.

23. NE'PETA.

Calyx arid, striate; upper lip of the corolla emarginate, lower 3-lobed, the middle lobe largest and crenate, margin of the orifice reflected; stamens approximate.

Said to be named from *Nepet*, a town in Tuscany. Cal. tube ovoid, straight, about 15-nerved. Tube of cor. cylindric, long, incurved, dilated at the throat which has on each side a small, reflexed lobe, upper lip erect, slightly cleft; lower lip large, rounded, concave, with many notches. Fil. close together, covered by the upper lip. Ach. 4, in the bottom of the cal.

N. CATA'RIA.

Erect, tall, hoary-tomentose; *leaves* petiolate, cordate, coarsely crenate-serrate; *flowers* spiked, the whorls slightly pedunculated. This common plant is naturalized every where about old buildings and fences. Cats are very fond of it and will often devour it with the greatest avidity. Hence the specific name. Stem square, pubescent, branching, 2—3 feet high. Leaves very evenly bordered by tooth-like or crenate serratures, and as well as the whole plant, covered with a soft, hoary down, paler beneath. Flowers many, white or purplish, the lower lip dotted with crimson. July. Per. *Catnep.*

24. GLECHO'MA.

Calyx 5-cleft, subequal; upper lip of the corolla bifid; anthers approaching each other in pairs, each pair forming a cross.

Gr. γληχων, a sort of thyme. Cal. cylindric, tubular, about 15-nerved. Cor. ringent; tube compressed, slender; upper lip cleft half way down, covering the stam. Anth. 2-celled, cells divaricate.

G. HEDERA'CEA. *L.* Nepeta Glechoma. *Benth.*

Leaves reniform, crenate; *corolla* about 3 times as long as the calyx. A creeping plant naturalized about hedges, walls, &c. Stems prostrate, radicating at base, square, varying in length from a few inches to 1—2 feet. Leaves petiolate, opposite, roundish, cordate-reniform, hairy and glaucous. Flowers axillary, about 3 together. Corolla bluish purple with a variegated throat. The 2 anthers of each pair of stamens meet with their 2 divaricate cells forming the appearance of a cross. The plant is aromatic, and was formerly used in ale, also in medicine. May. Per. *Gill-over-the-ground. Ground Ivy.*

25. LOPHA'NTHUS.

Calyx 15-nerved, oblique, 5-cleft, upper segments longer; corolla bilabiate, upper lip bifidly emarginate, lower lip 3-lobed, the middle lobe broader and crenate; stamens diverging.

Gr. λοφος, a crest, ανθος, a flower. Flowers in dense, terminal spikes. Calyx tubular. Anth. 2-celled, cells parallel.

1. L. NEPETOI'DES. *Benth.* Hyssopus nepetoides. *L.*

Stem smooth, quadrangular, with the angles acute and slightly winged; *leaves* ovate and ovate-lanceolate, acutely serrate; *petioles* smoothish. A tall, branching, pale green herb, common about fences and dry hedges. Stem 3—6 feet high, the sides somewhat concave and the angles prominent. Leaves acuminate, about 4 inches in length and 2 in width. Flowers in crowded axillary verticils forming a terminal spike which is nearly continuous above. Corolla pale yellow. Stamens exserted. July. Aug. Per.

2. L. SCHROPHULARIFO'LIUS. *Benth.* Hyssopus schrophularifolius. *L.*

Stem pubescent, quadrangular, with the angles obtuse; *leaves* cordate-ovate, crenate-serrate; *petioles* ciliate-pubescent. Tall, stout, and branching, with

the general aspect of the former species and found in similar situations. The herbage is often changed to dark purple. Stem 2—4 feet high, purple. Leaves about 5 inches in length, and 3 inches wide, coarsely serrate, acuminate. Flowers in crowded, axillary verticils, forming a long, dense, terminal spike. Corolla pale purple. Stamens and style exserted. July, Aug. Per.

Tribe 8. STACHYDEÆ.

Calyx oblique or rarely sub-bilabiate, 3—10-toothed. Corolla bilabiate, upper lip galeate or flat, lower lip unequally 3-lobed. Stamens ascending, upper pair shorter.

26. PHYSOSTE'GIA.

Calyx campanulate, subequally 5-toothed; corolla tube much exserted, throat inflated, upper lip concave, middle division of lower lip largest, roundish, emarginate; stamens 4, unconnected, ascending beneath the upper lip.

Gr. φυσα, a bladder, and στηγη, a covering; from the inflated corollas. Cal. tube inflated, short. Cor. ringent, tube length of cal. throat very large, exserted, oblong, inflated, the lateral seg. of lower lip erect as if belonging to the throat. Fil. concealed by the upper lip.

P. VIRGINIA'NA. Dracocephalum Virginianum.

Spikes dense, square; *calyx teeth* nearly equal. A beautiful plant native in Penn. and southward, but often adorning our gardens where it spreads rapidly. It is 2—3 feet high, very smooth, dark green. Stem square, thick, rigid. Leaves opposite, closely sessile, 4—5 inches long, ⅔ of an inch wide with remote and shallow teeth, of a shining dark green. Flowers in 4-rowed spikes, numerous, dense. Bracts subulate. Corolla pale purple, about an inch long, spotted inside. Aug. Sept. Per. *Lion's-heart.*

27. LA'MIUM.

Upper lip of the corolla vaulted, galeate, nearly entire, lower lip broad, emarginate, lateral lobes truncate, often toothed on each side near the margin of the dilated throat.

Lat. *lamia*, the name of a sea-monster, to which we may, if we please, liken the grotesque flowers. Cal. tube dilated at mouth, with 5 mucronate teeth. Cor. ringent, with a short cylindric, crooked tube; middle lobe of the lower lip somewhat stiped or contracted at base. Fil. covered by the upper lip.

L. AMPLEXICAU'LE.

Leaves roundish, incisely crenate, floral ones broadly cordate, obtuse, sessile, amplexicaul, lower ones petiolate. A small, slender herb, found in cultivated grounds. Stems ascending, several from the same root, 6—10 inches high, with opposite, short, broad, hairy leaves deeply crenate or cut; lower ones on stalks an inch or more in length. Flowers in dense verticels, closely sessile in the axils of the upper leaves. Calyx hairy. Corolla purple, downy, the tube much exserted, the lower lip spotted with white. Naturalized. Flowers from May to November. Ann. *Henbit.*

28. LEONU'RUS.

Calyx teeth subspinescent; upper lip of the corolla entire, hairy, concave, erect, lower lip 3-lobed, the middle lobe obcordate; anthers sprinkled with shining dots.

Gr. λεων, a lion, and ουρα, tail; from the appearance of the spikes of flowers. Cal. funnel-shaped, 5—10-nerved, 5-toothed. Cor. ringent, hairy. Fil. ascending, longer than the orifice, covered by the upper lip, the lower pair longest. Ach. triquetrous, truncate at the summit.

L. CARDI'ACA.

Lower stem leaves palmate-lobed, uppermost lanceolate, often trifid, all of them toothed, cuneiform at base; *corolla* longer than the calyx, the tube with a hairy ring within. Native of Tartary, whence it was first introduced into Europe and thence to America, ever following the footsteps of civilized man. It is common about rubbish, stone walls and waste places. Stem about 3 feet high, downy, square, large, purplish, bearing its opposite, stalked, rough leaves arranged in 4 verticel rows. Flowers in many whorls. Calyx rigid and bristly. Corolla purplish, hairy without, variegated within. Motherwort has a strong and pungent smell, and has considerable reputation as an ingredient in *herb-drinks* for colds, coughs, &c. July. Per. *Motherwort.*

29. GALEO'PSIS.

Calyx 5-cleft, spinescent; upper lip of the corolla vaulted, subcrenate, lower lip with 3 unequal lobes, having, 2 teeth on its upper side.

Gr. γαλη, a weasel, and οψις, appearance. Its grotesque flowers may be likened to that animal. Cal. tubular, with 5 spreading, mucronate teeth. Cor. ringent, tube slender at base, dilated at the throat, which has two prominences. Middle lobe of lower lip largest, cleft and crenate. Fil. ascending, covered by the upper lip.

1. G. TE'TRAHIT.

Stem hispid, the internodes thickened upwards; *leaves* ovate, hispid, serrate; *corolla* twice as long as the calyx, the upper lip nearly straight, concave. A common weed, naturalized in waste and cultivated grounds, 1—2 feet high. Stem obtusely 4-angled, remarkably swelled below the joint, and covered with prickly, deflexed bristles Leaves hairy on both sides, ovate, acute, serrate. Flowers in dense verticels. Calyx with 5 acute, bristly teeth. Corolla variegated with white and purple, upper lip concave, purple; longer than the 3-lobed lower one. June, July. Ann. *Hemp Nettle.*

2. G. LADA'NUM.

Stem hairy, internodes equal; *leaves* lanceolate, subserrate, hairy; *upper lip of the corolla* slightly crenate. A smaller species, naturalized, growing among rubbish, in gravelly soils, &c. Stem about a foot high, not swollen below the joints, with opposite branches. Flowers in dense, remote whorls. Corollas usually rose-colored, often white or variegated, spotted with crimson. Aug. Sept. Ann. *Red Hemp Nettle.*

30. STACHYS.

Upper lip of the corolla vaulted, lower lip 3-lobed, the middle lobe largest; stamens ascending, lower ones longer; anthers approximated in pairs.

Gr. σταχυς, a spike; this being the inflorescence of all the species. Cal. tube angular, cleft half way down into 5 subulate, awned teeth, rather unequal. Cor. ringent, the tube short, throat oblong, lower lip larger than upper, the middle segment very large, entire or emarginate, folded backwards. Stam. bent outward after flowering. Ach. obtuse, not truncate.

1. S. A'SPERA.

Stem erect, the angles retrorsely hispid or rough; *leaves* subpetiolate, oblong-lanceolate, acutely serrate, smooth or nearly so; *verticels of the spike* about 6-flowered; *calyx* smoothish, with spreading teeth, at length spinescent. Fields and roadsides. About a foot high and rather slender. Stem erect, square, generally hispid backward on the angles, sometimes nearly smooth. Leaves smooth, membranaceous, generally rounded at base and acute at apex. Spike terminal, leafy, composed of verticels, each with 4—8 pale purple flowers. Variable in pubescence. July. Per. *Hedge Nettle. Wound-wort.*

2. S. SYLVA'TICA. *Nutt.* S. hispida. *P.*

Stem very hispid on the angles; *leaves* on short petioles, ovate-lanceolate, sometimes cordate at base, acuminate, crenate-serrate, hirsute; *verticels* 2—6-flowered; *floral leaves* very small, lanceolate-linear, hispid-ciliate; *calyx* hirsute, with ciliate, spinescent teeth. A very rough and hairy herb, in low woods and on shady banks. Stem erect, 12—18 inches high. Leaves 3—4 inches long and $\frac{1}{3}$ as wide, with rounded or uncinate serratures, the upper surface with short, bristly hairs. Petioles 0—$\frac{1}{2}$ inch long, and with the veins beneath, hispid. Spike long, slender, terminal, very rough and hairy. Corolla exserted, purple, spotted. July, Aug. Per.

3. S. HYSSOPIFO'LIA. *Mx.* S. palustris. *Walt.*

Stem scarcely pubescent, slender, erect; *leaves* sessile, linear-lanceolate, slightly dentate; *verticels* about 4-flowered; *calyx* subspinescent. A slender species 6—12 inches high, in meadows, N. Y. and Ms., rare. Leaves very narrow, often linear, with minute teeth or finely serrulate. Flowers sessile. Corolla a little hairy, purple. July. Per.

31. MARRU'BIUM.

Calyx 5—10-nerved, 5—10-toothed; upper lip of the corolla entire or bifid, straight, linear, the tube included.

Name said to be from Marrubium a town in Italy. Cor. bilabiate; lower lip broader, cleft half way down into 3 seg. of which the middle one is broadest and emarginate, the others acute. Fil. shorter than cor. concealed under the upper lip. Anth. 2-celled; cells divaricate.

M. VULGA'RE.

Stems ascending, hoary-pubescent; *leaves* roundish-ovate, crenate-dentate, downy-canescent beneath; *calyx* of 10 setaceous, uncinate teeth. Introduced into fields and roadsides. Stem 1—2 feet high, branching at base, or several from the same root, covered with a white, downy pubescence. Leaves petiolate, 1—2 inches in diameter, whitish and rough-veined above, very woolly beneath, rounded and toothed. Flowers white, in sessile, axillary, dense, hairy verticels. Calyx woolly, the teeth spreading and alternately shorter. The hoarhound is an aromatic and bitter herb, well known as an ingredient in cough candy. It is a tonic and diuretic, and much used in pulmonary affections. Per. *Hoarhound.*

32. BALLO'TA.

Calyx hypocrateriform, 5-toothed. 10-striate; upper lip of the corolla concave, crenate; seeds ovate, 3-cornered.

Gr βαλλω, to reject; on account of its offensive odor. Invol. of linear leaflets under the whorls. Cor. ringent; tube cyl. long as cal.; lower lip 3-fid, obtuse, the middle seg. largest, emarginate.

B. NIGRA.

Leaves ovate, subcordate, undivided, serrate; *calyx* somewhat truncate, throat dilated, teeth spreading, acuminate. Said to have been introduced, but is frequently met with about hedges, &c., in Ms. and Conn. Stem 2—3 feet high, pubescent as well as the opposite, broad leaves. Flowers purple or white, in axillary verticels. This plant has the general appearance of hoarhound (Marrabium) but not its fragrance. July. Per. *Stinking Hoarhound.*

TRIBE 9. AJUGOIDEÆ.

Corolla upper lip very short, or split to the base, or rarely erect and vaulted, lower lip longer. Stamens ascending, much exserted. Achenia reticulately rugose.

33. TRICHOSTE'MA.

Calyx resupinate; corolla tube slender, limb 5-cleft, the lobes oblong, declined; stamens much exserted, lower ones longer.

Gr. θριξ, τριχος, hair, and στημα, a stamen; because of its long hair-like stamens. Cal. swelling, oblique; upper lip (lower by the twisting of the peduncle) of 2, short acute teeth; lower (at length the upper) twice as long, 3-toothed. Cor. tube very short; lower lip in 3 seg., middle one very small. Anth. 2-celled, cells divaricate.

T. DICHO'TOMA.

Leaves oblong-lanceolate, attenuate at base, obtuse, entire, pubescent; *flowers* resupinate; *stamens* very long, exserted. Found on dry or rocky hills and in sandy soils. An interesting plant, a foot high. Stem obtusely 4-angled, hairy, bushy. Branches opposite, divided, the upper pair generally forming a dichotomous division of the stem. Leaves petiolate, of a rhombic, ovate-lanceolate form. Flowers axillary and terminal, becoming inverted by the twisting of the petiole. Corolla purple. Stamens slender, of a delicate purplish hue, gracefully bending from the lower lip of the corolla to the upper, forming a beautiful arch. Aug. Ann. *Blue-curls.*

34. TEU'CRIUM.

Corolla with the 4 upper lobes nearly equal, the lowest largest, roundish; stamens exserted from the cleft in the upper side of the tube.

Teucer, the founder of Troy, is said by Pliny to have first employed this plant medicinally. Cal. subcampanulate and subregular, in 5 acute segments. Cor. ringent, lower lip elongated.

T. CANADE'NSE.

Plant erect, hoary-pubescent; *leaves* lanceolate, acute, serrate, petiolate; *bracts* linear-lanceolate, longer than the calyx; *spike* long, of many crowded verticels of flowers; *upper teeth of calyx* broader. Grows by roadsides, &c. about 2 feet high. Stem simple or branched, square, with concave sides. Leaves 3 times as long as wide, somewhat rounded at base, green above, hoary with down beneath. Bracts longer than the calyx. Flowers disposed in axillary verticels, each of 4—6. Calyx with 5 broad, nearly equal segments, the 2 lower ones narrower. Corolla purplish, apparently without the upper lip, instead of which is a fissure through which the stamens are exserted. July. Per. *Wild Germander.*

β. *Virginicum; upper leaves* ovate-oblong, nearly sessile; *bracts* about as long as the calyx. Habits similar to the last.

ORDER XCV. BORAGINACEÆ. *The Borage Tribe.*

Cal.—Sepals 5, regular, more or less united at base, persistent. [æstivation.
Cor.—Petals 5, regular (very rarely irregular), united at base, hypogynous, imbricate in
Sta.—5, inserted into the corolla and alternate with its lobes.
Ova.—Deeply 4-lobed, the style arising from the base of the lobes.
Fr.—Nuts or achenia 4, distinct, 1-seeded. Seeds without albumen.
Embryo with a superior radicle. *Cotyledons* plano-convex.

Herbs or sometimes shrubby plants, with round stems and alternate, rough leaves. Stipules 0. Flowers of the cyanic series, rarely yellow, usually in one-sided racemes which are at first revolute, evolving as the corollas expand. The species are very abundant in the south of Europe and the middle of Asia, but become rare as we approach the arctic circle. All our native species are herbaceous.

Properties. Mucilaginous and emollient plants, never poisonous.

Conspectus of the genera.

Corolla funnel or bell-form,	orifice closed,	tube straight.	Ach. glahrous.	imperforate.	*Symphitum.*	12
				perf'ate at base.	*Anchusa.*	10
			Ach. cloth'd with hook'd bristles		*Cynoglossum.*	2
		tube incurved.	Plant very hirsute-bristly.		*Lycopsis.*	9
				Flowers small.	*Lithospermum.*	7
	orifice open.	Stamens included.	Style short	Flowers large.	*Pulmonaria.*	8
			Style much exserted.		*Onosmodium.*	5
		Stamens exserted.	Corolla irregular.		*Echium.*	4
Corolla salver-form,			orifice closed.	Ach. smooth & shining.	*Myosotis.*	11
				Achenia bristly.	*Echinospermum.*	3
		not yellow,	orifice open or naked.		*Heliotropium.*	13
		yellow, limb in 5, rounded segments.			*Batschia.*	6
Corolla rotate, with acute segments.			Stamens converging.		*Borago.*	1

1. BORA'GO.

Calyx 5-parted; corolla rotate, with acute segments; orifice crowned; filaments converging; achenia rounded, imperforate at base, inserted lengthwise into an excavated receptacle.

Said to be corrupted from *cor*, heart, and *ago*, to affect; on account of its *cordial* qualities. None of the species native.

1. B. OFFICINA'LIS.—*Leaves* ovate, alternate, the lower ones petiolate; *calyx* spreading; *peduncles* terminal, many-flowered. Native of England, and with us a common inhabitant of the garden. The whole plant is rough with short, bristly hairs, erect, 3 feet high, with terminal clusters of handsome, sky-blue flowers during summer. It was formerly in high repute as a cordial. The young leaves form a good salad and pot-herb. Ann.
Common Borage.

2. B. ORIENTA'LIS.—*Leaves* cordate, petiolate; *peduncles* many-flowered; *stamens* exserted, villous. An ornamental garden plant, native of Turkey. Stem and leaves hairy. Flowers blue, appearing in the spring months. Ann. *Oriental Borage.*

2. CYNOGLO'SSUM.

Calyx 5-parted; corolla short, infundibuliform, vaulted; orifice closed by 5 converging, convex scales; achenia depressed, fixed laterally to the style.

Gr. κυων, a dog, and γλοσσα, tongue; from the form of the long, soft leaves. Fls. blue and red. Cor. a little longer than cal. Fil. short. Style rather long, subulate, central. Stig. small, emarginate.

1. C. OFFICINA'LE.

Silky-pubescent; *leaves* lanceolate, acute, radical ones alternate at the base, petiolate, cauline ones sessile; *stamens* shorter than corolla. An erect,

downy plant, of a dull green color, 18—20 inches high and emitting a disagreeable smell, which several distinguished botanists have compared to the smell of young mice! Grows in waste grounds and roadsides. Stem erect, hairy, 1—2 feet high. Leaves hoary with soft down on both sides, entire, upper ones clasping, with broad bases, lower ones 6—10 inches long and 1—2 inches wide, tapering into a long, attenuated base (winged petiole?) pointed at apex. Clusters terminal, panicled, recurved at the end. Flowers with a downy calyx and a dull red corolla. Calyx leaflike in fruit. Seeds rough, with hooked prickles July. Per. Introduced. *Hound's-tongue.*

2. C. AMPLEXICAU'LE.

Hirsute-pilose; *leaves* oblong-oval, acute, upper ones clasping, cordate at base; *corymb* terminal, leafless, on a long peduncle. Inhabiting woods and thickets. A very hairy plant, 2 feet high, simple, bearing at the top of its leafless summit, a small, panicled corymb of pale purple flowers. Radical leaves 5—6 inches long and half as wide. Calyx and pedicels very hairy. June. Per. *Clasping Hound's-tongue.*

3. ECHINOSPE'RMUM.

Calyx 5-parted; corolla hypocrateriform, orifice closed with concave scales; seeds echinate, compressed or angular, fixed to a central column.

1. E. VIRGI'NICUM. *Lehm.* Rochelia Virg. *Torr.* Myosotis Vir. *L.*

Stem much branched; *leaves* oblong-lanceolate, acuminate, scabrous above; *racemes* divaricate, dichotomous; *fruit* densely covered with hooked prickles. An erect, hairy weed, in rocky grounds and rubbish. Stem furrowed, 2—3 feet high, with many slender, remote, wide-spread branches, each terminating in a centrifugal, racemose inflorescence. Leaves entire, remote, large (3—4 inches long), tapering to each end, the lower ones petioled. Flowers very small, white, the pedicels nodding in fruit. Jl. Ann. *Virginian Mouse-ear.*

2. E. LAPPULA. *Lehm.* Rochelia Lapp. *Torr.* Myosotis Lap. *L.*

Stem branched above; *leaves* lanceolate or linear-lanceolate, hairy; *corolla* longer than the calyx, the border erect-spreading; *achenia* each with 2 rows of hooked prickles on the margin. An erect herb, in dry soils, roadsides, &c. Stem having a dry, grayish aspect from its dense hairs, about a foot high, undivided except at the top where it branches into a kind of panicle. Leaves an inch long, and 1—2 lines wide, sessile. Flowers very small, blue. July. Ann. *Burr-seed.*

4. E'CHIUM.

Calyx 5-parted, segments subulate, erect; corolla campanulate, obliquely and unequally lobed, with a short tube and naked orifice; stigma cleft; achenia tuberculate, imperforate.

Gr. ἐχις, a viper; from the spotted stem of some species. Shrubs and annual herbs Fls cyanic, irregular. Fil. unequal, long as cor. subulate. Anth. extrorse. Style long, cleft at the summit.

E. VULGA'RE.

Stem rough with bristles and tubercles; *cauline leaves* lanceolate, and rough with bristles; *spikes* lateral, hairy, deflected. A rough plant, with large, handsome, violet-colored flowers, found in fields and waste grounds. Stem 18—20 inches high, round, with entire, dull green leaves, which are 2—6

inches long and a fifth as wide, lower ones petiolate, upper ones amplexicaul, in numerous, crowded, axillary, recurved spikes, appearing in June and July. *Viper's Bugloss.*

5. ONOSMO'DIUM.

Calyx deeply 5-parted, with linear segments; corolla subcampanulate, having a ventricose, half 5-cleft limb, with the segments converging and the orifice open; anthers sessile, sagittate, included; style much exserted; achenia imperforate, shining.

From *onosma*, another genus of this order and *εἶδος*, appearance; because it resembles that genus in habit. Perennial herbs. Style twice as long as the corolla.

O. HI'SPIDUM. *Muh.* Lithospermum Virginianum. *L.*

Plant hispid, branched; *leaves* obovate-lanceolate, pappillose-punctate; *segments of the corolla* lanceolate. A very rough plant, found in dry, hilly grounds, N. Y. Stem about 1½ feet high. Leaves about 3-nerved, large, twice as long as wide, often oval and even ovate-lanceolate. Flowers greenish white, in leafy racemes which are recurved at first but finally erect. Aug. Per. *False Gromwell.*

6. BA'TSCHIA.

Calyx 5-parted; corolla hypocrateriform, with a hairy ring at the base of the tube inside, an open orifice and rounded segments; stigma emarginate; achenia hard, shining.

Named in honor of Prof. Batsch, a German botanist. Fls. rather large, yellow. Tube of cor. much longer than cal. Limb nearly flat.

B. CANE'SCENS. *Gmel.* Lithospermum canescens. *Lehm.*

Leaves oblong, obtuse, silky-canescent above, villous beneath; *flowers* axillary; *tube of the corolla* thrice as long as the very short calyx. A small, handsome plant, but rare. Found on dry hills, N. Y. Stem 8—12 inches high, erect, simple, rarely a little branched above, hoary-villose. Leaves sessile, 2—3 lines wide and 4 times as long, 1-nerved. Flowers crowded near the summit of the stem. Calyx segments lanceolate, acute. Corolla bright orange-yellow, including the subsessile stamens and short style. June, July. The root is used to dye red by the Indians, who call it *Puccoon.*

7. LITHOSPE'RMUM.

Calyx 5-parted, persistent, corolla small, funnel-form; limb 5-lobed, orifice open; stamens included; stigma obtuse, bifid; achenia bony, rugose or smooth, imperforate at base.

Gr. λίθος, a stone, and σπέρμα, seed; the seeds being hard and shining like little pebbles. Small, weed-like plants. Style shorter than the tube.

1. L. OFFICINA'LE.

Leaves broad-lanceolate, acute, veiny; *calyx* nearly equal to the tube of the corolla; *achenia* smooth. A rough, weed-like plant, introduced from Europe. Grows in dry, gravelly soils, common. Stem much branched, arising 1—2 feet, from a white, fusiform root. Leaves grayish green, rough

on the upper side, hairy beneath, rather acute, entire. Flowers small, white, axillary, solitary, pedicellate, in recurved, leafy spikes. Seeds ovate, white or grayish, polished, stony. June. *Gromwell.*

2. L. ARVE'NSE.

Leaves linear-lanceolate, obtuse, hairy; *calyx* nearly equal to the corolla, with spreading segments; *achenia* rugose. A rough, pilose, annual weed, introduced into our cornfields and waste grounds. The stem is branching, erect, 12—15 inches high, from a fusiform root with reddish bark. Leaves bright green, rough, sessile, 1—2 inches in length, with only the central nerve; the lower ones obtuse and narrowed to the base; upper ones subacute. Flowers small, white, subsessile, solitary, in the axils of the upper leaves. May, June. *Corn Gromwell.*

8. PULMONA'RIA.

Calyx prismatic, 5-angled, 5-toothed; corolla infundibuliform, with a cylindric tube, orifice open, limb of 5 obtuse lobes; achenia imperforate.

Probably named from its having been used as a medicine in lung complaints; hence also the English name, lung wort. Handsome perennial herbs. Fls. blue. Cal. permanent. Tube of cor. about the length of the cal. Fil. very short, within the throat.

1. P. VIRGI'NICA.

Plant erect, smooth; *calyx* much shorter than the tube of the corolla, limb longer than the tube; *radical leaves* obovate-elliptical, obtuse; *cauline ones* long-lanceolate. A smooth, erect, and elegant plant, about 20 inches high, native in N. Y., sometimes cultivated. The leaves of the stem are sessile, narrower than those of the root, whose width is $\frac{2}{3}$ of their length. Flowers in terminal clusters. Corolla blue, funnel-form, sitting upon a short, 5-toothed calyx. Stamens and style included. May. Per. *Virginian Lung-wort.*

2 P. OFFICINA'LIS.—*Plant* rough; *calyx* the length of the tube of the corolla; *radical leaves* ovate, cordate, scabrous; *cauline ones* ovate, sessile. Native of England, but naturalized and cultivated in our gardens. Flowers blue, in terminal clusters. Stem a foot high. This as well as other foreign species of this genus, is a rough-leaved plant, while the several American species are uniformly smooth. May. Per. *Common Lung-wort.*

9. LYCO'PSIS.

Calyx 5-cleft; corolla funnel-form, tube incurved, orifice closed with ovate, converging scales; achenia perforated at base, ovoid, angular.

Gr. λυκος, a wolf, and ωψ, the eye; such being the appearance, which the small blue flowers of this plant presents to an active imagination. Annual herbs. Tube of cor. twice bent. Fil. very small. Stig. emarginate.

L. ARVE'NSIS.

Plant hispid; leaves lanceolate, repand-denticulate; *racemes* leafy; *flowers* sessile; *calyx* shorter than the tube of the corolla. A very hispid, almost bristly plant, found in fields and roadsides, probably introduced. Stem erect, branching, roundish, about a foot high. Leaves 5 or 6 times as long as wide, the margin irregularly and slightly toothed. Flowers small. Calyx erect. Corolla sky-blue with white scales within. Jn., Jl. *Wild Bugloss.*

10. ANCHU'SA.

Calyx 5-parted; corolla infundibuliform, vaulted, orifice closed with 5 prominent scales; achenia perforate at the base and their surfaces generally rugose; stamens included; stigma emarginate.

Gr. αγχουσα, paint. The root of one species, A. tinctoriæ, was once used for staining the features. Handsome herbs. None of the species are indigenous.

A. OFFICINA'LIS.—*Leaves* lanceolate, strigose; *spikes* one-sided, imbricated; *calyx* as long as the tube of the corolla. A rough garden plant, native of Britain. The English name, Bugloss, comes from the Greek, signifying *ox-tongue*, on account of the long, rough leaves. Stem 2 feet high, rough with bristly hairs. Bracts ovate. Flowers purple, with a melliferous corolla very attractive to bees. The leaves are juicy, and the root mucilaginous, used in medicine to promote the eruption of the small pox. Blossoms all summer. Per. *Bugloss.*

11. MYOSO'TIS.

Calyx 5-cleft; corolla hypocrateriform, the 5 lobes slightly emarginate, orifice closed with short, concave scales; achenia ovate, smooth, with a small cavity at base.

Gr. μυος, a rat, and (ους) οτος, an ear, from the form of the leaves. Limb flat. Tube short. Stam. included. Style central, as long as the tube.

1. M. PALU'STRIS. *Roth.* M. scorpoides. *Willd.*

Stem subramose; *leaves* lanceolate-oblong, obtuse, with short, scattered hairs; *racemes* without bracts; *pedicels* divaricate in fruit, twice as long as the short, spreading, smooth segments of the calyx. Grows about ditches and marshes, often called *water-mouse-ear* from the leaves, which are roughish with appressed hairs. Stem about a foot high, with scattered hairs, ascending from long, creeping roots. Leaves scattered, sessile, 1—3 inches long, $\frac{1}{6}$ as wide. Racemes terminal or often one of them supra-axillary, one-sided. Flowers small, blue, on pedicels half an inch long. May—Aug. Per. *Marsh Scorpion-grass.*

2. M. ARVE'NSIS. *Sibth.* Lycopsis Virginica. *L.?*

Stem branching; *leaves* oval-lanceolate, hairy; *racemes* long; *pedicels* in fruit suberect, about as long as the calyx; *calyx segments* oval, acuminate, hairy, closed, about the length of the corolla. Found in sandy woods. Whole plant of a grayish hue from its dense pubescence. Stem 4—10 inches high, at length much branched. Leaves $\frac{1}{2}$—1 inch in length, sessile, acutish, the lower ones oblanceolate, obtuse, tapering to a short petiole. Racemes revolute at the end, not secund, short at first, but arising at length 6, 8, or even 12 inches. Flowers very small, white. June. Ann. *Forget-me-not.*

12. SY'MPHYTUM.

Calyx 5-parted; corolla tubular-campanulate, orifice closed with 5, subulate scales, converging into a cone; achenia gibbous, imperforate.

Gr. συμφυσις, a joining or healing; from its reputation for healing wounds. Coarse, Oriental herbs

S. OFFICINA'LE.—*Leaves* ovate-lanceolate, decurrent. A large, coarse-looking but showy exotic, nearly naturalized in our gardens and shrubberies. Whole plant rough with dense hairs. Stem 3—4 feet high, winged by the decurrent leaves, bearing terminal, revolute racemes. Corollas white, pink and red, appearing all summer. Root perennial. It abounds with mucilage and has long been regarded as an efficient vulnerary. *Comfrey.*

13. HELIOTRO'PIUM.

Calyx 5-parted; corolla hypocrateriform, orifice naked, limb 5-cleft, with the sinuses plaited; stamens included; stigma peltate; achenia cohering without a common receptacle.

Gr. ἥλιος, the sun, τρέπω, to turn; ancient botanists affirm that the flowers of these plants always turn towards the sun. Annual ornamental herbs, none native at the North.

1. H. EUROPÆ'UM.—Herbaceous; *leaves* ovate, entire, rugose and tomentose; *spikes* in pairs. A delicate annual, native of Europe and at the South, cultivated among stove-plants. Stem 8—12 inches high. Flowers white, mostly in 2, terminal, long, scorpoid racemes. *European Heliotrope.*

2. H. PERUVIA'NUM.—Shrubby. *Leaves* ovate-lanceolate; *flowers* in numerous, aggregated spikes. Native of Peru. A small, elegant green-house shrub, 1—2 feet high. Leaves rough, serrulate, twice as long as wide, on short petioles. Flowers small but numerous, very fragrant, white or tinged with purple. *Peruvian Heliotrope.*

ORDER XCVI. HYDROPHYLLACEÆ. *The Water-leaf Tribe.*

Cal.—5-cleft, the sinuses usually with reflexed appendages, persistent.
Cor.—5-lobed, regular, with 10 melliferous scales near the base.
Sta.—5, inserted into the base of the corolla and alternate with the lobes.
Anth.—2-celled, versatile. [or on stalks from the base of the cavity.
Ova.—Free, simple, 1-celled. *Style* single, terminal, bifid. *Stigmas* 2. *Placenta* 2, parietal
Fr.—Capsule invested with the permanent calyx.
Sds.—Few, crustaceous. *Embryo* conical, in abundant, cartilaginous albumen.

American herbs, with alternate (rarely opposite), lobed leaves. Of no known use.

HYDROPH'YLLUM.

Sepals slightly united at base; corolla campanulate, with 5 longitudinal, margined, nectariferous grooves inside; stamens exserted; capsule globose, 2-celled, 2-valved, 4-seeded, 3 of them mostly abortive.

Gr. ὕδωρ, water, and φύλλον, a leaf. Pretty marsh herbs, which in the spring have a quantity of water in each leaf. Lvs. divided, alternate. Fls. corymbose, supra-axillary or terminal.

1. H. VIRGI'NICUM.

Plant nearly smooth; *leaves* pinnatifid and pinnate, the segments oval-lanceolate, incisely serrate; *fascicles* conglomerate; *peduncles* as long as the petioles. An inhabitant of wet or moist woods, N. H. and Vt. Stem a foot high, bearing large, roundish tufts of flowers peculiarly distinguished by their

exserted stamens and style which are twice the length of the bell-shaped corollas. Leaves few, on long, clasping petioles, with about 5 distinct leaflets, the upper 3 more or less confluent at base, all irregularly toothed. Corollas varying from white to sky blue. Jn. Per. *Virginian Water-leaf.*

2. H. CANADE'NSE.

Plant somewhat hairy; *leaves* subpalmately lobed, angular, cordate; *flowers* in crowded fascicles; *peduncles* shorter than the petioles. Similar in aspect to the last. Found in alpine woods. Stem 12—18 inches high, with large, roughish leaves, divided into 5—7 lobes. Fascicles of flowers dense, axillary and terminal. Corollas white, or variously tinged with purple. Stamens and style much exserted, as in the last. Jn., Jl. Per. *Canadian Water-leaf.*

ORDER XCVIII. POLEMONIACEÆ. *The Greek Valererian Tribe.*

Cal.—5 united sepals, inferior, persistent, sometimes irregular.
Cor.—5 united petals, regular, the lobes imbricate or twisted in æstivation.
Sta.—5, inserted into the midst of the corolla tube and alternate with its lobes.
Ova.—3-celled, free. *Styles* united into 1. *Stigma* trifid.
Caps.—3-celled, 3-valved, loculicidal, valves also separating from the 3-cornered axis.
Sds.—Few or many. *Albumen* horny. *Embryo* foliaceous.

Chiefly North American herbs. Leaves opposite or alternate, simple or divided. They are valued only in cultivation as ornamental plants.

Genera.

Corolla salver-form.	Capsule 3-seeded.	Leaves opposite, simple. . .	*Phlox.*	1
Corolla bell-shaped.	Capsule many-seeded.	Leaves alternate, pinnate.	*Polemonium.*	2

1. PHLOX.

Calyx prismatic, deeply 5-cleft; corolla hypocrateriform, the tube more or less curved; stamens very unequal, inserted in the tube of the corolla above the middle; capsule 3-celled, cells 1-seeded.

Gr. φλοξ, a flame; from the color and profusion of the flowers. A highly ornamental and much cultivated, North American genus. Lvs. mostly opposite, sessile, simple. Fls. in terminal panicles. Cal. segment erect or converging. Cor. limb flat, in 5, cuneiform lobes. Caps. roundish-ovoid. Sds. oblong, concave.

1. P. DIVARICA'TA.

Low, diffuse, pubescent; *leaves* broadly lanceolate, acute, upper ones alternate; *panicle* loose, corymbose; *peduncles* diverging; *calyx teeth* linear, subulate; *segments of corolla* cordate. Grows in moist soils, N. Y. Stems numerous, decumbent, 1—2 feet long. Flowers of a peculiar light but brilliant grayish-blue; the buds violet. May. Per. *Early-flowering Lychnidea.*

2. P. PANICULA'TA.

Stem smooth, erect; *leaves* lanceolate, tapering, rough-edged, flat; *corymbs* panicled; *calyx* awned; *segments of the corolla* rounded. This well-known favorite of our gardens is found native in many parts of the U. S. though perhaps not in N. England. It flourishes in rich, moist soil, or in leaf-mould and peat. Stem 2—3 feet high, ending in a large panicle of innumerable, pink-colored, scentless flowers, continuing in blossom from July to Sept. Per. *Panicled Lychnidea.*

β. *alba* has white, fragrant blossoms.

3. P. PYRAMIDA'LIS.—*Stem* erect, rough; *leaves* cordate-ovate, acute, smooth; *flowers* in a dense, fastigiate-pyramidal panicle; *teeth of the calyx* erect. Native of the Middle and Southern States. Stem spotted, 3 feet high, bearing at top a dense pyramid of rich purple, honey-scented flowers, rendering this species one of the most ornamental of the flower garden. It continues in flower all summer. Per. *Pyramidal Lychnidea.*

4. P. MACULA'TA.—*Stem* rough, erect, spotted; *leaves* oblong-lanceolate, rough-edged, glabrous; *panicle* oblong, crowded; *teeth of the calyx* recurved. The cultivation of this and the following species is similar to the foregoing. Stem 2 feet high, covered with purple spots. Flowers red. July. Aug. Per. *Spotted Lychnidea.*

5. P. SUBULA'TA.—Cæspitose, hoary-pubescent; *leaves* linear, pungent, ciliate; *pedicels* few, terminal. A dwarf species on mountains in Penn. in dense, turfy masses, spangled over in May with rose-colored flowers. Corymbs few-flowered. Pedicels 3-cleft. Segments of the corolla wedge-form, emarginate. Sepals subulate. Cultivated in borders. Per. *Moss Pink.*

2. POLEMO'NIUM.

Calyx campanulate, 5-cleft; corolla rotate-campanulate, limb 5-lobed, erect, tube short, closed at the base by 5 stameniferous valves; capsule 3-celled, 3-valved, cells many-seeded.

Gr. πολεμος, war. Pliny relates that two kings fought for the merit of the discovery of the virtues of the plant to which he gave this appellation. Herbs, with alternate, pinnately-divided leaves. Fls. terminal. Fil. dilated at base and issuing from the ends of the valves.

1. P. REPTANS.

Stem smooth, branching, erect; *leaves* pinnately 7—11-foliate, leaflets, oval-lanceolate, acute; *flowers* terminal, nodding. A handsome plant of woods and damp grounds in N. Y., &c., and sometimes cultivated. Stem 12—18 inches high, weak, fleshy. Leaflets mostly 7, subopposite, smooth, entire, sessile, an inch long and half as wide. Flowers numerous, rather large, on short petioles. Segments of the calyx lanceolate-acute, persistent, much shorter than the tube of the corolla. Corolla blue, lobes short, rounded at the ends. Anthers introrse. Root *creeping.* Per. *American Greek-Valerian.*

2. P. CŒRU'LEUM.—*Stem* smooth, simple, erect; *leaves* pinnately 11—17-foliate; *flowers* erect; *calyx* equalling the tube of the corolla. A handsome, cultivated plant, native in England. Stems clustered, several from the same root, about 2 feet high, hollow, stout, each dividing at top into a corymbose panicle. Leaves mostly radical, on long, grooved petioles; leaflets all sessile, ovate-lanceolate, subopposite, oblique, odd one lanceolate. Flowers terminal, suberect. Corolla blue, about half an inch in diameter. June, July. Per. *European Greek-Valerian.*

β. *alba*; *flowers* white.

ORDER XCIX. DIAPENSIACEÆ.

Cal.—Sepals 5, much imbricated, surrounded at base with imbricated scales.
Cor.—Petals 5, united, regular, imbricated in æstivation.
Sta.—5, equal, the filaments petaloid and inserted on the corolla tube.

Anth.—2-celled, transversely valved.
Ova.—3-celled, free. *Styles* united into 1. *Stigma* 3-lobed.
Fr.—Capsule 3-valved, loculicidal. *Seeds* many, small, albuminous.

Prostrate, suffruticose plants, with crowded, evergreen leaves and terminal, solitary flowers. Natives of the north of Europe and the northern parts of N. America.

DIAPE'NSIA.

Calyx 5-parted, calyculate with 3 bracts at base; corolla hypocrateriform, limb 5-cleft, flat; stamens 5, from the summit of the tube; stigmas 3; capsule 3-celled, 3-valved, many-seeded.

A Greek name formerly applied to the Saniele as a vulnerary. Low, evergreen undershrubs.

D. LAPPO'NICA.

Cæspitose; *leaves* dense, spathulate, fleshy, evergreen, obtuse and entire; *flowers* peduneulated. A little, leafy plant, 2—3 inches high, growing on the summits of the White Mts. in N. Hampshire, forming dense tufts among the rocks. Leaves crowded, pale beneath, fleshy, 5—8 lines long, 1 line wide, with a revolute margin, clasping base, and broadly obtuse point. Flowers on short, terminal, solitary peduneles which are an inch long in fruit. Calyx of 5, obtuse leaves, longer than the leafy bracts at its base. Corolla white, with 5, flat segments. July. Per. *Northern Diapensia.*

Another species, *D. cuneifolia*, very abundant in the pine barrens of New Jersey, is said by Dr. Peck, to be also an inhabitant of the White Mts., but I have not observed it there, after diligent search.

ORDER C. CONVOLVULACEÆ. *The Morning-glory Tribe.*

Cal.—Sepals 5, much imbricated, usually united at base, persistent.
Cor.—Regular, limb 5-lobed or entire, plaited and twisted in æstivation.
Sta.—5, inserted into the base of the corolla and alternate with its lobes.
Ova.—2—4-celled, free. *Styles* united into 1.
Fr.—Capsule 2—4-celled, valves with septifragal dehiscence.
Sds.—Few, large, with thin mucilaginous albumen. *Cotyledons* foliaceous.

An important order of twining or trailing herbs or shrubs. Leaves alternate. Flowers showy. Juice usually milky. They are very abundant in tropical climates, rare in cold.

Properties. The roots abound in an acrid, milky juice which is strongly purgative. *Jalap* of the shops is the product of the root of C. Jalapa of Mexico; *Scammony* of C. Scammonia, native of Levant. The drastic qualities of both depend upon the presence of a peculiar resin. The *sweet potato*, a valuable article of food is the product of C. Batatas, native at the South.

Conspectus of the Genera.

Plants	leafy. Calyx naked or nearly so.	*Convolvulus.*	1
	leafy. Calyx enclosed in 2, large, leafy bracts.	*Calystegia.*	2
	leafless, parasitic, orange-colored.	*Cuscuta.*	3

1. CONVO'LVULUS.

Calyx 5-parted, naked or with 2 small bracts near the base; corolla campanulate or funnel-form, 5-plaited; stamens shorter than the limb; ovary 2—3-celled, cells 2-ovuled; style simple; stigma simple or 2-lobed; capsule valvate, 2—4-celled.

Lat. *convolvere*, to entwine; from the habit. A large genus of twining or prostrate herbs (rarely shrubby).

1. C. ARVE'NSIS.

Leaves sagittate-hastate, the lobes being acute; *peduncles* mostly 1-flowered; *bracts* minute, remote from the flower. A twining plant, growing in fields and pastures. Stems several feet long, climbing or prostrate, a little hairy. Leaves 1—2 inches long, the lower ones obtuse. Flowers small, white, often with a tinge of red. The small, acute bracts are near the middle of the peduncle. June. Per. *Small Bindweed.*

2. C. PANDURA'TUS.

Stem twining; *leaves* broad-cordate or panduriform; *peduncles* long, 1—4-flowered; *calyx* smooth; *corolla* tubular campanulate. In sandy fields, N. Y. Stems several from the same root, 4—8 feet long, slender, smooth. Leaves 2—3 inches long and of about the same width, acute or obtuse, with rounded lobes at the base, sometimes lobed and hollowed on the sides and becoming fiddle-shaped. Petioles 2—3 inches long. Peduncles axillary, longer than the petioles, generally branching at the top, and bearing several large flowers. Corolla 2 inches long, purple and white. Jl., Aug. Per. *Wild Potatoe.*

3. C. PURPU'REA. *L.* (Ipomæa purpurea. *P.*)—*Leaves* cordate, entire; *fruit* nodding; *peduncles* 2—5-flowered; *pedicels* thick; *calyx* hispid. Stems climbing many feet. Leaves roundish, heart-shaped. Flowers large, beautiful, generally of a dark purple, sometimes blue, flesh colored, striped, &c. A well known and favorite climber and free flower, of the easiest culture. Native at the South and West. Jn. Ann. *Common Morning-glory.*

4. C. TRI'COLOR.—*Leaves* lanceolate, ovate, smooth; *stem* declinate; *flowers* solitary. A favorite border annual, the *C. minor* of florists, in distinction from C. purpureus, which they call *C. major.* Stem weak, 1—3 feet long. Flowers yellowish at the bottom, white in the middle, and of a fine sky blue on the upper part of the border. July. *Tricolored Bindweed.*

5. C. NIL.—*Leaves* cordate, 3-lobed; *flowers* half 5-cleft; *peduncles* shorter than the petioles, 1—3-flowered. A very beautiful twining plant, found wild in Penn., but best known as a garden annual. Stem and leaves somewhat hairy. Calyx very hairy, the segments long acuminate. Flowers large, the tube white and the border of a clear blue color (whence its specific name, Anil or Nil, indigo). It is of the easiest culture, and raised from the seed. Blossoms from July to September. *Morning-glory.*

6. C. QUAMO'CLIT.—*Leaves* pinnate with filiform pinnæ; *peduncles* a little longer than the leaf, 1-flowered. An exceedingly beautiful, tender annual, native at the South, cultivated. The specific name is from the Greek κυαμος, a bean, and κλιτος, dwarf; resembling the climbing bean, but less tall. The flowers vary in hue from dark red to rose-color. Aug. *Jasmine Bindweed.*

7. C. BATA'TUS.—*Leaves* cordate, hastate, angular-lobed, 5-nerved, smoothish; *peduncles* long; *flowers* fascicled; *sepals* lanceolate, acuminate. The sweet potato is native of both Indies and cultivated in all tropical climates. Not only the tubers, but the leaves and tender shoots are boiled and eaten. The tubers are sweet and considered nutritive. This is the *potato* of the old English botanists, of Shakspeare, and their cotemporaries, the *Solanum tuberosum* then being unknown. The stem is round, hispid, prostrate, creeping, sending out scattered, oblong tubers which are purplish without. Flowers large, purple or white. *Sweet Potato.*

2. CALYSTE'GIA.

Calyx 5-parted, included in 2 large foliaceous bracts; corolla campanulate, 5-plicate; stamens subequal, shorter

than the limb; ovary half-bilocular, 4-ovuled; style simple; stigmas 2, obtuse; capsule 1-celled, 4-seeded.

Gr. καλυξ, calyx, στεγη, a covering; alluding to the conspicuous bracts which envelop the calyx. Herbs, twining or prostrate, with a milky juice. Peduncles 1-flowered, solitary.

1. C. SPITHAMÆ'US. *L.* Convolvulus Spithamæus. *L.* C. stans. *Mx.*

Stem erect or assurgent; *leaves* oblong-lanceolate, subcordate, hoary-pubescent; *peduncles* 1-flowered, generally longer than the leaves. An erect, downy species, (a *span*) 8—10 inches high, found in fields and hilly pastures. Stem branching, leafy, bearing one, often two or more, large, white flowers, on peduncles 2—4 inches long, issuing from near the root. Leaves 2—3 inches long, half as wide, oval, with an abrupt, cordate base, and on petioles $\frac{1}{4}$ as long. Bracts concealing the calyx. Jn. Per. *Erect Bindweed.*

2. C. SE'PIUM. *Br.* Convolvulus Sepium. *L.*

Stem twining; *leaves* sagittate, the lobes being truncate and the apex generally acute; *peduncles* quadrangular, 1-flowered; *bracts* cordate, much longer than the calyx. A vigorous climber, in hedges and low grounds. Stems 5—8 feet in length. Leaves cordate-sagittate, 2—4 inches long and half as wide. Flowers numerous, large, white, with a reddish tinge, appearing in long succession. The bracts are so close to the corolla as to appear like the calyx which they entirely conceal. It is cultivated as a shade for windows, arbors, &c. Jn., Jl. Per. *Hedge Calystegia. Rutland Beauty.*

3. CUSCU'TA.

Calyx 5 (rarely 4)-cleft; corolla globose-campanulate, 4—5-cleft, marescent; stamens 4—5, inserted upon the corolla at the clefts; stigmas 2; capsule 2-celled, circumscissile at the base; cells 2-seeded.

Etymology unknown. Parasitic, leafless herbs, without verdure, twining from right to left. Fls. in lateral clusters. Cor. with 5, adnate scales below the base of the stamens.

1. C. AMERICAN'A.

Flowers pedunculate, in umbellate clusters, pentamerous; *styles* erect; *stigmas* capitate. An extremely delicate vine, found in damp places, by rivulets, &c. The stem is smooth, slender, 3—5 feet long, springing from the soil at first, but after having twined itself about the low plants in its way, and becoming fixed upon them by its lateral radicles, it withers away at base, and is henceforth disconnected with the soil. It is of a light-orange color, wholly destitute of green, furnished with a few minute scales, branching, always turning from right to left, or hanging in festoons. Flowers nearly globose, about a line long and on peduncles of about the same length. Calyx segments round-obtuse. Corolla twice as long, yellowish white. August. Ann. *American Dodder.*

2. C. EUROPÆ'A.

Flowers sessile, in dense, capitate clusters, the parts in 4s and 5s; *styles* divergent; *stigmas* acute. Introduced from Europe into the cultivated grounds, N. Y., growing chiefly on flax. Stems filiform, smooth, twining, reddish-orange colored, destitute of green like the foregoing, 2—4 feet long. Flowers in small bunches, pale yellow or rose colored. Rare. July. Ann. *European Dodder.*

ORDER CI. SOLANACEÆ. *The Potato Tribe.*

Cal.—Sepals 4—5, more or less united, mostly persistent.
Cor.—Regular, limb 4—5-cleft, plaited in æstivation, deciduous.
Sta.—4—5 (sometimes 1 abortive), inserted on the corolla alternate with its segments.
Anth.—Bursting longitudinally, rarely by terminal pores.
Ova.—Free (superior), 2-celled, (4-celled in Datura) with the placenta in the axis.
Styles and *stigmas* united into 1.
Fr.—A capsule or berry. *Seeds* numerous. *Embryo* curved, lying in fleshy albumen.

Herbaceous or shrubby plants, with a colorless juice. Leaves alternate. Inflorescence often supra-axillary. Pedicels without bracts. They are diffused throughout the world, except the frigid zones, but are most abundant in the torrid.

Properties. These are highly important. A large portion of the genera are pervaded by a narcotic principle, rendering the herbage and fruit dangerously poisonous, yet furnishing some of the most active medicines; as the *henbane* (Hyosciamus), *belladonna* (Atropa), *stramonium* (Datura), *tobacco* (Nicotiana), &c. At the same time several species of solanum afford wholesome and nutritious food, not because they are free from the narcotic principle, but because it is expelled in the process of cooking or ripening in the sun. Such are the tubers of the invaluable potato, the fruit of the *tomato* and *egg plant*. The genus Capsicum is entirely free from narcotine, and produces the well-known stimulant fruit, *Cayenne pepper*.

Conspectus of the Genera.

Corolla	regular,	rotate with a very short tube.	Fruit baccate,	sitting on the calyx.	*Solanum.* 1
				enclosed in the calyx.	*Physalis.* 4
			Fruit capsular, dry.		*Capsicum.* 2
		campanulate...	Sepals lanceolate.		*Atropa.* 6
			Sepals leafy, sagittate.		*Nicandra.* 5
			Herbs..	Capsule spinose.	*Datura.* 7
				Capsule smooth.	*Nicotiana.* 8
		funnel-form....	Trailing shrubs.		*Lycium.* 3
	irregular,	salver-form, lower segments larger.			*Petunia.* 9
		funnel-form, upper segments larger.			*Hyosciamus.* 10

1. SOLA'NUM.

Calyx of 5 (rarely more) sepals, slightly united at base, persistent; corolla rotate, or campanulate; anthers slightly cohering, opening by 2 pores at the top; berry 2-celled, many-seeded.

Etymology uncertain. Herbs, sometimes shrubby and climbing. Lvs. simple or pinnate. Peduncles 1—many-flowered, supra-axillary or terminal. Cor. of a very short tube and a 5-lobed, plaited limb. Berry roundish, with a terminal scar, 2—6-celled.

1. S. DULCAMA'RA.

Stem shrubby, flexuous, thornless; *leaves* ovate-cordate, upper ones hastate; *clusters* cymose. A well-known, shrubby climber, with blue flowers and red berries. Stem branching, several feet in length, climbing about hedges and thickets in low grounds. Lower leaves between heart and egg-shaped, entire; the upper ones becoming auriculate or hastate. Flowers drooping, on branching peduncles from the side of the stem. Corolla of 5 reflexed segments, purple, with 2 green spots at the base of each segment. Berries bright red. The root being chewed gives at first, a sensation of bitterness, then of sweetness. The berries are poisonous. The leaves and twigs have been used medicinally with good effect. Jl. *Bittersweet. Woody Nightshade.*

2. S. NIGRUM.

Stem herbaceous, thornless; *leaves* ovate, toothed and waved; *umbels* lateral, drooping. A weed-like plant, without beauty and of suspicious aspect, about rubbish, in old fields, &c. Stem erect, branching, angular, a foot high. Leaves almost always with the lamina perforated and the margin erose as if

gnawed by insects. Peduncles branching into a sort of umbel, from the side of the stem, generally remote from the leaves. Flowers white, anthers yellow. Berries globose, black. It is reputed poisonous, but used medicinally. Flowers in summer. Ann. *Black Nightshade.*

3. S. TUBERO'SUM.—*Root* tuberous; *stem* herbaceous; *segments of the leaves* unequal, the alternate ones minute; *flowers* subcorymbed; *corolla* 5-angled. This most valuable plant is supposed to be a native of S. America, where it still grows wild. Although it now constitutes so large a portion of the food of civilized man, it was scarcely known until the 17th century, and was not extensively cultivated before the middle of the 18th. The varieties of the potato are very numerous, differing in their time of ripening, quality, color, form, size, &c. New varieties are readily procured by sowing the seeds, which, with care, will produce good tubers the third year. *Common Potato.*

4. S. LYCOSPE'RSICUM.—Hairy; *stem* herbaceous, weak; *leaves* unequally pinnatifid, segments cut, glaucous beneath; *fruit* torulose, furrowed, smooth. This plant resembles the potato in its general aspect. It grows 2 feet high, with jagged leaves, greenish yellow flowers, and an unpleasant odor. The fruit is large and abundant, with acute furrows, at first green, becoming when ripe of a beautiful red. This plant has recently come into high repute, and its cultivation is rapidly extending. The fruit is prepared in various ways, for sauces, stews, &c., having an agreeable acid taste. Preserved in vinegar with spices it makes a good pickle, and prepared in a certain way with sugar it forms "an excellent substitute for figs." Ann. *Tomato.*

β. fruit without furrows, not torulose, golden yellow and much smaller.

5. S. MELONGE'NA.—*Stem* prickly; *leaves* ovate, subsinuate, downy, prickly; *flowers* many-parted. An annual, herbaceous, branching plant, about 2 feet high. The fruit, with which it is heavily laden, consists of egg-shaped berries, from the size of an egg to that of an ordinary water melon, smooth, and of a glossy purple. It is prepared for food in various ways, and considered wholesome and delicious eating. Like the tomato it is cultivated from the seed sown early in warm, dry and mellow soil. *Egg-plant.*

6. S. PSEUDO-CAPSICUM.—*Stem* shrubby; *leaves* oblong-lanceolate, subrepand; *peduncles* 1-flowered, opposite the leaves. A small ornamental shrub, native of Madeira, cultivated. Stem 2—4 feet high, branching into a symmetrical summit. Leaves dark evergreen, smooth and shining, about 2 inches long. Flowers white, with orange anthers, drooping, succeeded by a few scarlet, globose berries of the size of small cherries. *Jerusalem Cherry.*

2. CA'PSICUM.

Calyx 5-cleft, erect, persistent; corolla rotate, 5-cleft; anthers connivent; fruit capsular, dry, inflated.

Gr. καπτω, to bite; on account of the taste of the fruit. Herbs (rarely shrubby). Fls. mostly axillary and solitary. Cor. of a very short tube and a plaited limb. Caps. 2—3-celled. Seeds flat, very acrid.

1. C. A'NNUUM.—*Stem* herbaceous; *fruit* oblong, on smooth stalks, erect or pendulous. An herbaceous, branching annual, from India, cultivated for its fruit, whose properties and uses are well known. July. *Red Pepper.*

2. C. BACCA'TUM.—*Stem* shrubby; *fruit* globose, erect, in pairs, on smooth stalks. July—Sept. *Bird Pepper.*

3. C. FRUTE'SCENS.—*Stem* erect, shrubby; *fruit* oblong, obtuse; *peduncles* smooth. This with the last species chiefly furnishes the *Cayenne pepper* of the shops. July—Sept. *Shrubby Pepper.*

3. LY'CIUM.

Calyx 2—5-cleft, short; corolla tubular, limb mostly 5-lobed, spreading, orifice closed by the beard of the filaments; stamens 4—5, exserted; berry 2-celled; seeds several, reniform.

Named from *Lycia*, the native country of the original species. Shrubs, the branches ending with a spinose point, and often having axillary spines. Fls. axillary, solitary or in pairs.

L. BA'RBARUM.—*Stem* angular; *branches* long, pendulous, somewhat spiny; *leaves* often fasciculate, lanceolate; *calyx* mostly 3-cleft. Native of Barbary, cultivated and nearly naturalized. It is a shrub, with long, slender, trailing or hanging branches which overspread walls, &c., with a thick, tangled mass. Leaves smooth, 3 times as long as wide, often broadest above, acute or obtuse, tapering into a petiole. Flowers greenish purple. Berries orange-red. June—Sept. *Matrimony-Vine.*

4. PHYSA'LIS.

Calyx 5-cleft, persistent, at length ventricose; corolla campanulate-rotate, tube very short, limb obscurely 5-lobed; stamens 5, connivent; berry globose, enclosed within the inflated, 5-angled, colored calyx.

Gr. φυσις, a bladder; the inflated calyx enclosing the fruit. Herbs (rarely shrubby), with axillary or supra-axillary flowers.

1. P. VISCO'SA. *Aik.* P. viscosa, obscura, pubescens, Pennsylvanica, &c., of authors.

Pubescent; *stem* decumbent, herbaceous; *branches* somewhat dichotomous and angular; *leaves* solitary or in pairs, ovate, more or less cordate, repand-toothed or entire; *flowers* solitary, axillary, pendulous. Dry fields, roadsides, &c. Stem more or less decumbent, about a foot high, often viscid as well as the whole plant. Leaves very variable in the same plant, 1—4 inches high of $\frac{1}{2}$, $\frac{2}{3}$, or even of equal breadth, acute, acuminate, or often obtuse at the apex, often abrupt at base, sometimes nearly or quite entire on the margin, twice as long as the petioles; when in pairs one of them is much smaller. Corolla twice as long as the calyx, greenish yellow, with 5 brownish spots at base inside. Fruit yellow or orange-colored, not unpleasant to the taste, enclosed in the enlarged, inflated, angular calyx. July.
Yellow Henbane. Ground Cherry.

β. *Pennsylvanica; leaves* in pairs, ovate, abruptly narrowed into the petiole, rather acuminate, entire, often unequal at base, nearly smooth.

2. P. ALKEKE'NGI.—*Stem* somewhat branching below; *leaves* in pairs, entire, acute; *calyx* of the fruit red or reddish. Native of S. Europe, cultivated for ornament. Plant about a foot high. Flowers white. Berries acid and somewhat bitter. *Winter Cherry.*

5. NICA'NDRA.

Calyx 5-cleft, 5-angled, the angles compressed, sepals sagittate; corolla campanulate; stamens 5, incurved; berry 3—5-celled, enveloped in the persistent calyx.

Named by Adanson in honor of Nicander, a Greek physician.

N. PHYSALOI'DES. *Adan.* Atropa physaloides. *L.*

Stem herbaceous; *leaves* glabrous, sinuate, angular; *flowers* solitary, axillary, on short peduncles; *calyx* closed, with the angles very acute. Native of Peru, cultivated in gardens, from whence it has in a few instances strayed into the neighboring fields. It is a large, coarse herb, 2—5 feet high, very branching. Leaves large, oblong, decurrent. Corolla slightly lobed, pale blue, white and with 5 blue spots in the centre. Jl.—Sept. *Apple of Peru.*

6. A'TROPA.

Calyx persistent, 5-cleft; corolla campanulate; stamens 5, distant; berry globose, 2-celled, sitting on the calyx.

Gr. Ατροπος, Eng. Atropa, the name of one of the three Fates in Grecian mythology whose office was to cut the thread of human life; this office, the poisonous fruit of this plant is also well adapted to perform.

A. BELLADO'NNA.—*Stem* herbaceous; *leaves* ovate, entire; *berries* black. This foreigner is far less repulsive in its appearance than most others of its order. The lurid, pale purple of the flower, indeed, looks suspicious, but not its smell; nor is there any warning of its deadly nature given by the aspect, taste or smell of the berries which are larger than cherries, round, green, at length of a fine glossy black, full of a purple juice. Stem 5 feet high, branching below, and with the large leaves, inclines more or less to a purplish hue. Every part of the plant, especially the berries, is poisonous. July. Per. *Deadly Nightshade.*

7. DATU'RA.

Calyx large, tubular, ventricose, 5-angled, deciduous, with a persistent, orbicular, peltate base; corolla infundibuliform, tube cylindric, long, limb 5-angled and plaited; stamens 5; stigma obtuse, bilamellate; capsule 2-celled, 4-valved; cells 2—3-parted.

An alteration of the Arabic name *tâtôrah.* Annual herbs, with bluish white or purple, solitary, axillary flowers.

D. STRAMO'NIUM.

Stem dichotomous; *leaves* ovate, smooth, angular-dentate; *capsule* spiny, erect. A well-known poisonous plant, growing among rubbish in waste places. Stem about 3 feet high, smooth, hollow. Leaves large, situated at the base of the dichotomous branches, their sides unequal, with large irregular teeth and sinuses. Flowers solitary, axillary; corolla funnel-shaped, with a long tube and a plaited, 5-toothed border, the color white with a slight tinge of purple. Fruit egg-shaped, the size of a small apple, covered with spines. Aug. Ann. Every part is poisonous, but, when used with certain restrictions, is a useful medicine for asthma, &c.

β. Tatula; *stem* and *flowers* purple.

8. NICOTIA'NA.

Calyx urceolate, 5-cleft; corolla infundibuliform, regular, limb 5-lobed; stamens 5; stigma emarginate; capsule 2-celled, 2—4-valved.

So named from John Nicot, of Nismes, Languedoc, ambassador of the king of France to Portugal, who seems to have introduced it into Europe. Annual,

coarse, narcotic herbs, with simple leaves and terminal flowers. Corollas white, tinged with green or purple.

1. N. RU'STICA.

Viscid-pubescent; *leaves* petioled, ovate, entire; *tube of the corolla* cylindric, longer than the calyx, segments round, obtuse. For the purposes of *tobacco* this plant is considered inferior to the Virginian. Stem 12—18 inches high. Flowers greenish yellow, in a terminal panicle or raceme. In western N. Y., said to have been introduced by the Indians. Aug. Ann.
Common Tobacco.

2. N. TABA'CUM.—Viscid-pubescent; *leaves* lanceolate, sessile, decurrent, *throat of the corolla* inflated; *lobes* acute. Stem 4—6 feet high. Leaves 1—2 feet long. Flowers rose-color, not inelegant. This and the foregoing species are the only plants cultivated as *tobacco*. They appear to have been natives of Central America Tobacco was first carried to England in 1586, from the Island of Tobago, or the Province of Tabasco in Mexico (whence its name). Sir Walter Raleigh has the *distinguished* honor of first introducing the practice of smoking from Virginia into England, more than 200 years ago, and in his house at Islington is still to be seen a shield bearing his arms, with a tobacco plant at the top! *Loudon.* It is now extensively cultivated in Virginia, Maryland and Ohio, whence it is exported in vast quantities. The use of this nauseous weed has become almost universal, and furnishes a striking illustration of the force of habit. Its first use, whether smoked or chewed, produces a deadly sickness; and it is only by repeated and painful trials that it can be tolerated. At length, however, it becomes so necessary to the comfort of its victim, that, at all times and places, its precious smoke or extract *must* be flowing continually from his mouth. Taken into the stomach, it is a powerful narcotic poison. Jl. Ann. *Virginian Tobacco.*

9. PETU'NIA.

Calyx tube short, the limb 5-cleft, foliaceous; corolla hypocrateriform, the tube cylindric, limb in 5, unequal, flat, plicate lobes; stamens 5, unequal, included, arising from the middle of the corolla tube; capsule 2-valved.

The Brazilian name is *petun*, Latinized, *petunia*. Herbs with simple leaves and axillary, solitary, showy flowers.

P. VIOLA'CEA.—*Stem* weak, viscid-pilose; *leaves* acute, on short petioles; *corolla* ventricose, cleft into rounded, acute lobes. A pretty, trailing or climbing plant, becoming quite popular in cultivation, native of Brazil. Whole plant clothed with clammy hairs. Stems simple, several from the same root, 2—8 feet long. Leaves 1—2 inches long, nearly as broad, tapering at base into a winged petiole, fleshy, nearly smooth beneath. Sepals obtuse. Peduncles as long as the leaves, and scarcely longer than the corolla tube. Limb of the corolla bright purple, an inch or more broad, upper segment smallest. Capsule furnished with a tooth each side of the sutures.

β. a'lba; corollas white. Between this and the above are many intermediate shades.

10. HYOSCY'AMUS.

Calyx tubular, 5-cleft; corolla infundibuliform, irregular; one of the 5, obtuse lobes larger; stamens 5, declinate; stigma capitate; capsule ovoid, 2-celled, opening with a lid near the summit.

Gr. ὑς, ὑος, a pig, and κυαμος, a bean; because the fruit, resembling a bean? while poisonous to other animals, may be eaten by pigs? with safety. Coarse, weed-like herbs, native in Eastern countries. Lvs. simple, large.

H. NIGER.

Stem branching, erect, very leafy; *leaves* sinuate, clasping; *flowers* sessile. A tall, well known, fœtid weed, growing about the rubbish of old houses, roadsides, &c. The whole plant is hairy, viscid, and of a sea-green hue, emitting a fœtid odor. Stem 2 feet high, round. Leaves large, oblong, cut into acute, sinuate lobes. Flowers in terminal, one-sided spikes; the corolla straw-color, finely reticulated with dark purple veins. The whole plant is reputed poisonous, but has long been regarded as an excellent medicine in nervous diseases, coughs, convulsions, &c. Jl. Bien. *Common Henbane.*

ORDER CII. GENTIANACEÆ. *The Gentian Tribe.*

Cal.—Sepals 4—5—10, united at base, persistent. [in æstivation.
Cor.—Usually regular, limb divided into as many lobes as there are sepals, mostly twisted
Sta.—Issuing from the tube of the corolla, as many as its lobes and alternate with them.
Ova.—1-celled, sometimes rendered apparently 2-celled by the introflexed placentæ.
Sty.—United into 1, or wanting. *Stigma* 1—2.
Fr.—Capsule many seeded. *Seeds* small. *Embryo* straight, with fleshy albumen.

A large and interesting order of herbaceous (seldom shrubby) plants, found in every region of the globe. Juice colorless. Leaves almost always opposite, entire and smooth. Flowers conspicuous.

Properties. An intensely bitter principle, called *gentianine*, pervades the whole order without exception, residing in every part, rendering them tonic and febrifugal. The *gentian* of the shops is most commonly the product of Gentiana lutea, but almost any of our species may be substituted for it. (Dr. Gray.) In the other genera of the order, the buck-bean (Menyanthes trifoliata), Villarsia nymphoides, Sabbatia angularis, Frasera Walteri, &c.,' are valued in medicine for the same properties. Many are cultivated for ornament.

Conspectus of the Genera.

Flowers	5—12-merous.	Cor. funnel or bell-form.	Lvs. simple.	Cor. ventricose.	*Gentiana.* 1
				Cor. funnel-form.	*Erythræa.* 6
			Leaves trifoliate.		*Menyanthes.* 8
		Corolla rotate.		Aerial. Stig. spiral.	*Sabbatia.* 3
				Floating aquatics.	*Limnanthemum.* 7
		Cor. without horns.	Petals entire.	Leaves minute, opposite.	*Centaurella.* 5
				Leaves large, (whorled).	*Frasera.* 4
			Petals fringed.		Crossopetalum. 1
	tetramerous.	Corolla with 4 horns at base.			*Halenia.* 2

1. GENTIA'NA.

Calyx 4—5-cleft; corolla campanulate, tubular at base, border 4—5-cleft; stamens 4—5, included; capsule 2-valved, 1-celled, many-seeded.

From *Gentius*, king of Illyria, who is said by Pliny to have first discovered the tonic virtues of this genus of plants. Herbaceous. Cor. with spreading, erect or converging lobes, almost always blue.

* Corolla 5—10-cleft.

1. G. SAPONA'RIA. *L.?* S. Andrewsii. *Grisebach.*

Leaves oval-lanceolate, 3-nerved, acute; *flowers* in whorled heads, sessile; *corollas* ventricose, clavate-campanulate, closed at top, 10-cleft, the inner segments plicate and fringed, equaling the exterior. A handsome plant, conspicuous in meadows and by brook-sides. Stem 12—18 inches high, simple, erect, smooth, with opposite, smooth leaves, scabrous on the margin,

resembling those of the common soapwort. Flowers large, bright-blue, erect, an inch and a half long, subsessile, in bunches at the top of the stem, and often solitary in the upper axils. The inflated corollas are so nearly closed at the top as to be easily mistaken for buds; and the young botanist waits in vain to see them expand. Calyx of 5 ovate segments, shorter than the tube. Sept. Oct. Per. *Soapwort Gentian.*

2. G. PNEUMONA'NTHE.

Stem terete; *leaves* linear-lanceolate, obtuse; terminal *flowers* fascicled, lateral ones solitary; *corolla* campanulate, with acute segments, the inner folds 1-toothed, short. Meadows, swamps, borders of mountain lakes, &c Resembles the former species, but more slender. Stem simple, erect, 10—15 inches high, very smooth, purple. Leaves an inch and a half long, 2—3 lines wide. Flowers large, 2—3 together at the summit of the stem, with a few solitary ones in the axils of the upper leaves. Corolla blue. Segments of the calyx linear, subacute. Aug. Sept. Per. *Marsh Gentian.*

3. G. QUINQUEFLO'RA. *Frœl.*

Stem 4-angled branching; *leaves* ovate-lanceolate, acute, 3-nerved; *flowers* terminal and axillary, about in 5s, pedicellate; *corolla* tubular-campanulate, in 5, lanceolate, setaceously acuminate segments; *calyx* very short. Woods and pastures. Stem a foot high, smooth, generally branched. Leaves 3—5-nerved, half-clasping, acute, smooth. Flowers small, on pedicels half an inch in length. Corolla pale blue, 4 times as long as the subulate sepals. Sept. Oct. Bien. *Five-flowered Gentian.*

* * Corolla 4-cleft, segments fimbriate. CROSSOPETALUM.

4. G. CRINI'TA. *Frœl.*

Stem terete, erect; *leaves* lanceolate, acute; *flowers* tetramerous; *segments of the corolla* cut-ciliate. The Fringed Gentian is among our most beautiful and interesting native plants; not uncommon in cool, low grounds. The stem is about 1 foot high, round and smooth. The branches are long, and, with a slight curve at base, become perfectly erect and straight, each bearing 2 leaves at the middle, and a single, large, erect flower at the top. Leaves broadest at base, tapering to the apex, 1—2 inches long and a fifth as wide. Calyx square, segments acuminate, equaling the tube of the corolla. Corolla of a bright bluish purple, the segments obovate, finely fringed at the margin, and expanded in the sunshine. Aug. Per. *Fringed Gentian.*

2. HALE'NIA.

Flowers tetramerous; corolla short campanulate, petals spurred at base, with glands at the base of the spur within; stigmas 2, terminating the acuminate ovary; capsule 1-celled; seeds indefinite, fixed to the sutures of the valves.

Removed from Swertia on account of the corniculate corollas.

H. DEFLE'XA. *Borkh.* Swertia corniculate. *Mx.* S. deflexa. *Smith.*

Stem erect, leafy; *leaves* 3—5-nerved, radical ones oblong-spathulate, tapering into a petiole, cauline ones oblong-lanceolate, acute, sessile; *spurs* cylindric, obtuse, deflexed, half as long as the corolla. Swamps, rare. Stem about 18 inches high, obtusely 4-angled, smooth, with few branches above. Leaves opposite 1½—2 inches long, a third as wide, smooth. Flowers greenish yellow, in terminal fascicles. Sepals linear-lanceolate, half as long as the petals. Corolla persistent, with 4, spreading horns or spurs descending between the sepals. Seeds numerous, obtuse, yellow. Aug. Bien. *Felwort.*

3. SABBA'TIA.

Calyx 5—12-parted; corolla rotate, limb 5—12-parted; stamens 5(—12); anthers erect, at length recurved, 2-celled, cells distinct; stigma 2-parted, with spiral divisions; capsule 1-celled, the valves a little introflexed.

Named by Adanson in honor of Sabbati, an Italian botanist of 1772, who published many fine botanical works. Herbs, mostly annual. Fls. in the American species mostly rose-colored.

1. S. STELLA'RIS. *P.* S. gracilis. *Ell.*

Stem erect, terete; *branches* dichotomous, elongated, 1-flowered; *leaves* lanceolate, acute; *segments of the calyx* subulate, half as long as the corolla; *segments of the corolla* obovate. Frequent in salt marshes. Stems somewhat angular, 12—18 inches high, with many forked divisions, forming a sort of loose corymb. Leaves somewhat fleshy, 1—2 inches long, sessile. Flowers rose-color, with a yellow *star* in the centre bordered with a purple ring. Aug. Bien. *Star-like Sabbatia.*

2. S. CHLOROI'DES.

Stem slender, weak angular; *leaves* lanceolate, erect; *branches* few, 1-flowered; *flowers* 7—12-parted; *sepals* linear, shorter than the corolla. An elegant plant, with large, showy flowers, in wet grounds. The stem is 2—3 feet high, somewhat angular, with few, opposite, spreading branches. Leaves an inch long, opposite, entire, smooth, closely sessile, acute, nerveless. Flowers solitary, terminal. Corolla much larger than the calyx, bright purple, with a yellow base, segments spathulate, rounded at end, varying in number with the other parts of the flower. June. Bien.

3. S. CALYCO'SA.

Stem erect, leafy, few-flowered; *leaves* oblong, 3-nerved, obtuse; *flowers* solitary, 7—9-parted; *calyx* leafy, longer than the corolla; *petals* oblanceolate. Fields and meadows. Stem a foot high, subangular, with a few, axillary, spreading branches. Leaves 1—2 inches long, sessile, mostly obtuse, oval, thin. Flowers large, terminal, often solitary, variable in the number of its parts, but mostly in 7s. Corolla pink-colored. Sepals acute. This species is quite variable. Aug. Bien.

4. S. ANGULA'RIS.

Stem erect, square, the angles somewhat winged; *leaves* ovate, amplexicaul; *peduncles* elongated, corymbed; *sepals* lanceolate, much shorter than the corolla. Wet meadows. Stem straight, 10—18 inches high, with opposite branches. Leaves closely embracing the stem, obscurely 5-nerved. Fls. pentamerous, petals obovate, obtuse. Aug. Ann. and Bien. *American Centaury.*

4. FRASE'RA.

Flowers mostly tetramerous; petals united at base, oval, spreading, deciduous, each with 1—2 bearded, orbicular glands in the middle; style 1; stigmas 2, distinct; capsule compressed, 1-celled; seeds few, imbricate, large, elliptic, margined.

In honor of John Fraser, an American cultivator of exotics.

F. WALTE'RI. *Mx.* F. Caroliniensis. *Walt.* F. verticillata. *Muh.*

Stem erect, terete, glabrous; *leaves* opposite and verticillate, oblong-lanceolate; *raceme* elongated, dense; *calyx* longer than the corolla; *glands* solitary.

Swamps, N. York, rare. Stem 3—5 feet high, obtusely 4-angled, the sides grooved, branching. Leaves smooth, 6—12 inches long and nearly $\frac{1}{3}$ as wide. Peduncles 1-flowered, axillary. Sepals linear-lanceolate, acute. Petals acuminate, greenish yellow, sprinkled with purple spots, the gland in the centre oval and covered with ciliæ. Anthers large, yellow. Style shorter than the stamens, persistent, crowning the flattened capsule. Seeds 6—8. *Torr.* Highly valued as a tonic. July. Bien. *American Columbo*

5. CENTAURE'LLA.

Flowers tetramerous; sepals appressed; corolla subcampanulate; petals slightly united, nearly erect; stigma thick, glandulous, somewhat bifid; capsule 1-celled, 2-valved, invested by the permanent calyx and corolla; seeds many.

Name a Lat. diminutive of Centaurea.

C. PANICULA'TA. *Mx.* Bartonia paniculata. *Muh.*

Stem smooth, branching above, branches subdivided; *leaves* subulate, minute; *panicle* erect, many-flowered; *calyx* equaling the corolla; *style* much shorter than the ovary. A slender and nearly naked plant, 5—8 inches high, of a yellowish green color. Native in wet grounds. Stem square, often twisted, with very minute, bract-like leaves, which are mostly opposite. Peduncles opposite or terminal, simple or branched. Pedicels bracteate at base, $\frac{1}{4}$ inch in length. Calyx segments linear-lanceolate, acute, shorter than the oval segments of the corolla. Corolla white, small, bearing the stamens at its clefts. Aug. Ann. *Screw-stem.*

6. ERYTHRÆ'A.

Flowers pentamerous; corolla funnel-form, with a short, spreading limb; anthers after flowering, spiral; style 1, erect, bearing 2, roundish stigmas; capsule linear, 1-celled.

Gr. ἐρυθρός, red; from the color of the flowers.

E. CENTAU'RIUM. *Pers.* E. pulchellum. *Hook?*

Stem erect, nearly simple; *leaves* ovate-oblong; *flowers* subsessile, fasciculate-paniculate; *calyx* half the length of the corolla tube. Dry grounds, Northern States. Stem 8—12 inches high. Flowers bright purple, in fascicles near the top of the stem. July, Aug. Ann. *Beck.* I am unacquainted with this plant, but, from Dr. Beck's account of it, should suppose it quite too near Gentiana.

7. LIMNA'NTHEMUM.

Calyx 5-parted; corolla subcampanulate, with a short tube and spreading, 5-lobed limb, deciduous, segments obtuse; stamens 5, alternating with 5 glands; capsule 1-celled, without valves; placentæ fleshy, many-seeded.

Gr. λιμνη, a lake, ανθος, a flower; from its aquatic habits. Herbs, submersed generally in stagnant water. Leaves floating. Corolla induplicate in æstivation.

L. LACUNO'SA. *Gmel.* Villarsia lac. *P.* V. aquatica. *R. & S.* V. trachysperma. *Mx.*

Floating; *leaves* reniform, subpeltate, scabrous above, spongy and lacunose beneath; *flowers* umbellate, from the summit of the stem (petiole?); *corolla*

smooth; *glands* from the base of the petals, stipitate; *calyx* shorter than the capsule; *seeds* muricate. A curious aquatic, in ponds and lakes. The stems are 1, 2 or 3 feet long, according to the depth of the water, bearing at the top three kinds of organs; the summit is prolonged into a petiole bearing a leaf about an inch in diameter, resembling that of Nymphæa; on the upper side is an umbel of small white flowers, blossoming successively at the surface of the water, and beneath, a cluster of short, simple, tuberous radicles, each of which is capable of producing a new plant. July. *Lake-flower.*

8. MENYA'NTHES.

Calyx 5-parted; corolla funnel-form, limb spreading, 5-lobed, villous within; stamens 5; style 1; stigma bifid; capsule 1-celled.

Gr. μηνη, a month, and ανθος, a flower; in allusion to its supposed property as an emenagogue.

M. TRIFOLIA'TA.

Leaves trifoliate. Grows in swamps, margins of ponds, &c. This fine plant arises from large, black roots descending deep into the boggy earth. Stem 8—12 inches high, round. Leaves on long, round footstalks stipuled at base. Leaflets obovate. Peduncle long, naked, terminal, bearing a pyramidal raceme of flesh-colored flowers. Pedicels thick, bracteate at base. Sepals obtuse, about a third as long as the corolla. Petals acute, about as long as the stamens. Bitter herbs, actively medicinal. Sometimes substituted for hops. May. Per. *Buck-bean.*

ORDER CIII. APOCYNACEÆ. *The Dog's-bane Tribe.*

Cal.—Sepals 5, united at base, persistent.
Cor.—5-lobed, regular, twisted in æstivation, deciduous.
Sta.—5, arising from the corolla and alternate with its segments.
Fil.—Distinct. *Anthers* 2-celled, opening lengthwise, sometimes slightly connected.
Pollen granular, globose or 5-lobed, immediately applied to the stigma.
Ova.—2, distinct or rarely united. *Styles* distinct or united. *Stigmas* united into 1 which is common to both styles.
Fr.—Follicles 2, rarely one of them abortive.
Sds.—Numerous, pendulous, with or without a coma, albuminous. *Embryo* foliaceous.

Trees, shrubs and herbs, with a milky juice. Leaves opposite, entire, without stipules. They are chiefly natives of the torrid zone.

Properties. These plants possess active and often suspicious qualities residing in the white juice with which the order is pervaded, and in the seeds which are often deadly poisons. The alkaloid, *strychnine* or *strichnia*, one of the most violent of poisons, is the active principle of the seeds of the Strychnos Nux-vomica of India. It is sometimes administered as a medicine, but with doubtful success. S. Tieute of Java is one kind of *Upas*. Cerbera Tanghin, a tree of Madagascar, is powerfully poisonous, a single seed being sufficient to destroy twenty persons. The Apocyneæ are emetic, and becoming highly valued in hydrocephalus, &c. The juice contains caoutchouc in small quantities, but in Sumatra this is obtained largely from the juice of Urceola elastica.

Conspectus of the Genera.

Plants	herbaceous. Corolla campanulate.	*Apocynum.*	1
	shrubby, trailing, evergreen.	*Vinca.*	2
	arborescent, evergreen, erect.	*Nerium.*	3

1. APO'CYNUM.

Calyx very small; corolla campanulate, lobes short; stamens included; filaments short, arising from the base of the corolla, and alternate with 5 glandular teeth; anthers sagittate,

connivent, cohering to the stigma by the middle; ovaries 2; stigmas connate; follicles long, sublinear, distinct.

Gr. *απο*, away, *κυων*, dog; Pliny says this plant is fatal to dogs. Herbs or shrubs (the northern species herbs). Fls. in cymes or panicles, terminal and axillary. Cor. white or flesh-color, divided into 5 short, spreading or revolute lobes.

1. A. ANDROSÆMIFO'LIUM.

Smooth; *leaves* ovate; *cymes* lateral and terminal; *limb of the corolla* spreading, the *tube* longer than the calyx. A smooth, elegant plant, 3 feet high, in hedges and borders of fields. Stem reddened by the sun, erect, branching above. Leaves dark green above, paler beneath, opposite, rounded at base and acute at apex, 2—3 inches long and $\frac{2}{3}$ as wide, on petioles $\frac{1}{4}$ inch long. Cymes paniculate, at the top of the branches and in the axils of the upper leaves. Pedicels $\frac{1}{3}$ inch long. Calyx much shorter than the corolla. Corolla as long as the pedicels, bell-shaped, white, striped with red, with 5, acute, spreading segments. Medicinal. June, July. Per. *Dog's-bane.*

2. A. CANNABI'NUM.

Smooth; *leaves* lanceolate, acute, paler beneath; *segments of the corolla* erect, the tube scarcely longer than the calyx. A species with narrower leaves and smaller flowers, found in low shades and hedges. Stem 2 feet high, generally dividing above into long, slender branches. Leaves 2—3 inches long, $\frac{1}{4}$ as wide, opposite, on petioles 2 lines long, and, when young, downy beneath. Cymes terminal, with linear bracts. Flowers about half as long as those of the last species. Sepals lanceolate, acute. Corolla white, with straight, obtuse segments. The fibres of the bark are strong and pliable, said to be used by the Indians in various ways as hemp. Jl., Aug. Per. *Indian Hemp.*

3. A. PUBE'SCENS.

Leaves ovate-lanceolate, hoary-pubescent beneath; *cymes* pubescent, with minute bracts; *tube of the corolla* longer than the calyx, with erect segments. In thickets and hedges. This species is most readily distinguished by its tomentose pubescence and its smaller, greenish flowers. Stem erect, with a few, suberect branches. Leaves opposite, 2—3 inches long, 2 fifths as wide, rather acute at base, tapering above into a mucronate point, and on stalks 2 lines long. Cymes terminal and axillary, few-flowered. July. Per. Distinct? *Pubescent Indian Hemp.*

4. A. HYPERICIFO'LIUM.

Smooth; *leaves* oblong, on very short petioles, obtuse or subcordate at base, mucronate; *cymes* terminal, shorter than the leaves; *calyx* nearly as long as the tube of the corolla. Gravelly banks of streams. Stem erect, 2 feet high, with opposite branches. Leaves 2—4 inches long, $\frac{1}{3}$ as wide, lower ones often sessile and cordate, smooth both sides but paler beneath. Flowers very small, in dense cymes at the ends of the stems and branches. Sepals lance-linear, about as long as the tube of the greenish white, erect corolla. Aug. Per. *St. John's-wort-leaved Dog's-bane.*

2. VINCA.

Corolla hypocrateriform, contorted, border 5-cleft, with the lobes oblique, orifice 5-angled; 2 glands at the base of the ovary; capsule follicular, erect, fusiform; seed oblong.

Lat. *vinculum*, a band; from the long twining branches; hence probably Anglo-Saxon *perwince*, and Eng *periwinkle*. Trailing shrubs. Lvs. evergreen.

1. V. MINOR.—*Stems* procumbent; *leaves* elliptic-lanceolate, smooth at the margins; *flowers* pedunculate; *sepals* lanceolate. Native in Europe. A handsome evergreen, flowering in May. Stems several feet in length, round, smooth and leafy. Leaves opposite, smooth and shining, about an inch long. Flowers solitary, axillary, alternate, violet, inodorous. *Lesser Periwinkle.*

2. V. MAJOR.—*Stems* nearly erect; *leaves* ovate, ciliate; *flowers* pedunculate; *sepals* setaceous, elongated. Native in Europe. Shrub, with numerous, slender, straggling branches, very leafy, forming light masses of evergreen foliage flourishing best beneath the shade of other plants. Leaves 1—2 inches in length, rounded or somewhat cordate at base. Flowers blue, appearing in May and June. *Greater Periwinkle.*

3. NE'RIUM.

Calyx with 5 teeth at the base outside of the corolla; corolla hypocrateriform, segments contorted, orifice with a corona consisting of 5, lasciniate leaflets; filaments inserted into the middle of the tube; anthers sagittate, adhering to the stigma by the middle.

The ancient Greek name. Oriental shrubs. Lvs. evergreen.

N. OLEA'NDER.—*Leaves* linear-lanceolate; *sepals* squarrose; *corona* flat, its segments 3-toothed. Native in S. Europe and the Levant. Stem branched. Leaves 3 together, on short stalks, smooth, very entire, coriaceous, with prominent, transverse veins beneath. Flowers terminal, corymbose, large and beautiful, rose-colored. One variety has white flowers, another variegated, and a third, double. This splendid shrub is common in Palestine, growing by rivulets, &c. It is commonly supposed by travellers to be the plant to which the Psalmist alludes, Ps. 1 : 3, and 37 : 35. *Rose Bay-tree. Oleander.*

ORDER CIV. ASCLEPIADACEÆ.

Cal.—Sepals 5, slightly united, persistent.
Cor.—Petals 5, united at base, regular, deciduous, twisted-imbricate in æstivation.
Sta.—5, inserted into the base of the corolla and alternate with its segments.
Fil.—Connate. *Anth.* 2-celled, cells sometimes nearly divided by partial septa.
Pol.—When the anther bursts cohering in masses which are as many as the cells, or confluent into pairs and adhering to the 5 processes of the stigma either by 2s, by 4s or singly.
Ova.—2, *styles* 2, approximate, often very short. *Stigmas* united into 1, which is common to both styles, and with 5 glandular angles.
Fr.—Follicles 2, one of them sometimes abortive.
Sts.—Numerous, pendulous, almost always comose at the hilum. *Albumen* thin.
Embryo straight. *Cotyledons* foliaceous. *Radicle* superior.

Herbs or shrubs with milky juice. Leaves almost constantly opposite, entire, exstipulate. They are chiefly natives of tropical regions, and especially abundant in S. Africa, S. India and New Holland, but are not uncommon in temperate regions.

Properties. Similar to those of the Apocynaceæ, but far less active. The juice is acrid and stimulating, and generally to be, at least, suspected. A few of the species are medicinal, but none of much consequence.

Conspectus of the Genera.

Stems	erect. Corolla reflexed.	Segments of corona with 5 horns.	*Asclepias.*	1
		Segments of corona without horns.	*Acerates.*	2
	climbing. Corolla rotate, petals flat, spreading.		*Periploca.*	3

1. ASCLE'PIAS.

Calyx small; petals united at base, reflexed; corona (nectary) 5-lobed, with 5, averted horns at the base of the lobes;

antheridium (connate mass of anthers) 5-angled, truncate, opening by 5 longitudinal fissures; pollinia (masses of pollen) 5 distinct pairs; follicles 2, ventricose; seeds comose.

Gr. name of Esculapius, the god of medicine and physicians. Herbs and shrubs (the northern species herbs). Flowers in pedunculate, axillary and terminal umbels. Cal. of 5, lanceolate, nearly distinct sepals, much shorter than the cor. Pet. oblong-lanceolate. Corona adnate to the filaments at their base, its leaflets erect, concave, fleshy, each mostly with an incurved, subulate tooth. Antheridium pyramidal, depressed, consisting of the 5 anthers consolidated around the pistil, separable at the winged angles. Anth. 2-celled, cells opening at the top, each containing a waxy mass of pollen suspended by a slender stipe, those of the adjacent cells of distinct anthers apparently geminate. Ova. 2, enclosed in the tube of the corona, 1 of them mostly abortive. Follicles muricate or smooth. Seeds imbricate, compressed.

* Leaves opposite.

1. A. SYRI'ACA.

Stem simple; *leaves* oblong-lanceolate, petiolate, gradually acute, tomentose beneath; *umbels* nodding; *segments of the corona* bidentate; *follicles* muricate. A coarse, very lactescent plant, common by roadsides, and in sandy fields. Stem 3—4 feet high, seldom branched. Leaves 5—8 inches long, 2—3 wide, tapering at both ends. Umbels several, axillary, subterminal, dense, globose, each of 20 or more sweet-scented flowers. Calyx segments lanceolate. Corolla pale-purple, reflexed, leaving the corona, which is of nearly the same hue, quite conspicuous. But few of the flowers prove fertile, producing oblong, pointed, rough pods or follicles, which contain a mass of long silky fibres with seeds attached. Jl. Per. *Syrian or Common Silkweed.*

2. A. PHYTOLACCOI'DES.

Stem erect, simple; *leaves* broad-ovate, acuminate, pale beneath, smooth, petiolate; *umbels* lateral, on long peduncles, nodding; *segments of the corona* truncate; bidentate, horns exserted. A tall and elegant species, found in low, shady grounds. Stem 4—5 feet high, smooth and slender. Leaves acuminate at each end, 6—9 inches long and nearly half as wide. Umbels near the top on lateral peduncles 4—6 inches long, and consisting each of about 10 large flowers, on pedicels about 2 inches in length. Petals green. Corona flesh-colored, each segment truncate, with its inner margin 2-toothed, and with a long, slender, incurved horn. Jn. Per. *Poke-leaved Silkweed.*

3. A. OBTUSIFO'LIA.

Stem erect, simple; *leaves* amplexicaul, oblong, obtuse, undulate, very smooth, glaucous beneath; *umbel* terminal, on a long peduncle, smooth; *horns of the corona* exsert. Stem 2—3 feet high, bearing a single (rarely 2) terminal umbel of 30—40 large, reddish green flowers. Leaves much waved on the margin, 4—5 inches long, and half as wide, with a broad, rounded, mucronate apex. Corolla light purple. Corona nearly white, its segments large, slightly 2-toothed. In shady grounds. Jl. Per. *Blunt-leaved Silkweed.*

4. A. PURPURA'SCENS.

Stem simple; *leaves* ovate, villous beneath; *umbels* erect; *horns of the corona* resupinate. In hedges and thickets, Charlestown, N. H., &c. Stem 3 feet or more high, simple or slightly branched at top. Leaves paler and downy beneath, the midrib purple, smooth above. Flowers in terminal, erect umbels. Calyx small, green Corolla dark purple, with reflexed segments. Corona purple, twice as long as the antheridium, its horns abruptly bent inwards to a horizontal position and lying close upon it. Jl. Per. *Purple Silkweed.*

5. A. INCARNA'TA.

Stem erect, branching above; *leaves* lanceolate, on short petioles, slightly tomentose; *umbels* numerous, erect, mostly terminal, often in opposite pairs; *segments of the corona* entire, horns exsert. A handsome species found in wet places. Stem 3—4 feet high, with two hairy lines. Leaves 4—7 inches long, ½—1½ inch wide, rather abrupt at base, tapering to a very acute point, on petioles ½ inch long. Umbels close, 2—6 together at the top of the stem or branches, each an inch or more in diameter, on a peduncle 2 inches long, and consisting of 10—20 small flowers. Corolla deep purple, corona paler. Horns subulate, curving inwards over the summit of the antheridium. July. Per. *Rose-colored Silkweed.*

β. *pulchra; stem* and *leaves* densely tomentose, the latter elliptical-lanceolate, 3—4 times as long as wide, sessile or on very short, hairy stalks. Stem 4—5 feet high. A remarkable variety.

6. A. AMŒ'NA.

Stem simple, downy in 2 rows; *leaves* subsessile, oblong-oval, pubescent beneath; *umbels* terminal, erect; *segments of the corona* erect, horns exsert. An elegant plant in low grounds. Stem 1—3 feet high. Leaves opposite, large, obtuse, rather thick, with purple nerves. Umbels arise from the top of the stem and often from the upper axils. Flowers bright purple, on long, straight pedicels. Corona long, erect, rigid. Jl. Per. *Oval-leaved Silkweed.*

7. A. QUADRIFO'LIA.

Stem erect, simple, smooth; *leaves* smooth, thin, petiolate, ovate, acuminate, mostly in 4s; *umbels* few, lax, on long, terminal or axillary peduncles; *corona* long, segments 2-toothed, horns short. An elegant species in dry woods. Stem about 2 feet high, slender, often with 1—2 hairy lines. Leaves opposite, the middle or upper pairs near together so as to appear in 4s, 2—3 inches long and half as wide, acute or acuminate, on petioles 2—4 inches long. Flowers small, white, on filiform stalks with a pubescent line. Corona twice as long as antheridium. July. Per. *Four-leaved Silkweed.*

β. *debilis; stem* weak, erect, simple; *leaves* large, thin, oval-lanceolate, acute at each end, the 4 upper ones sometimes whorled; *umbel* terminal. Grows in shades.

* * Leaves verticillate.

8. A. VETICILLA'TA.

Stem erect, simple, marked with pubescent lines; *leaves* generally verticillate, very narrowly linear, revolute; *segments of the corona* short, 2-toothed, horn falcate, exsert. A slender and delicate species, 2 feet high, in swamps (dry soil, *authors*). Leaves in whorls of 4—6, 3—5 inches long and a line in width. Flowers small, greenish white, in small, lateral umbels. Peduncles half as long as the leaves. July. Per. *Whorled Silkweed.*

* * * Leaves alternate.

9. A. TUBERO'SA.

Stem ascending, hairy, with spreading branches at top; *leaves* alternate, oblong-lanceolate, sessile; *umbels* numerous, forming large, terminal corymbs. Found in sandy fields. Root large, fleshy, sending up numerous stems. These are about 2 feet high, leafy, erect or ascending, hairy and colored. Leaves hairy, scattered, only the upper ones quite sessile, lanceolate, acute or acuminate, obtuse at base, 2—4 inches long, ½—1 inch wide. The corymb consists of numerous bright orange-colored flowers. Petals 5, oblong, reflexed, concealing the small calyx. Pods or follicles lanceolate, pointed, and, like the other species, containing long, silky down uniting the flat, ovate seeds to the receptacle. Aug. Per. Medicinal. *Tuberous-rooted Asclepias. Butterfly-weed.*

2. ACERA'TES.

Calyx small; corolla reflexed; corona of 5 distinct leaflets, without horns, leaflets concave, appressed to the angles of the antheridium; pollinia 5 pairs, pendulous; follicles smooth.

Gr. α, privative, κερατες, horns; alluding to the absence of the horns which are found in the corona of analogous genera. Herbs. Lvs. opposite. Fls. in umbels. Cor. 3 or 4 times as long as the calyx, abruptly reflexed from the base of the seg. of corona. Seg. of corona truncate at apex, erect, the margin with 2 short teeth opposite the antheridium and alternate with 5 small processes at base.

1. A. LANCEOLA'TA. *Ell.* A. viridiflora. β. lanceolata. *Grise.* Asclepias lan. *L.*

Stem decumbent, hirsute; *leaves* opposite, lanceolate, acute, sessile, hirsute; *umbels* lateral, solitary, sessile, nodding, dense, subglobose. Dry, sandy plains. Stem 2—3 feet long, branching at base. Leaves 4—8 inches long ½—¾ inch wide, tapering to a long acumination, scarcely petiolate. Flowers green, in one or more axillary umbels. July. Per.

2. A. VIRIDIFLO'RA. *Ell.* Asclepias viridiflora.

Stem simple, erect, hirsute; *leaves* oblong, obtuse, on short petioles, tomentose-pubescent on both sides; *umbels* lateral, solitary, dense, globose, on short peduncles, nodding; *pedicels* tomentose. Dry fields. Stem 2 feet high, covered with dense, close hairs. Leaves thick, 2—3 inches long, 1—2½ inches wide, varying from ovate to obovate, mucronate, often retuse. Flowers small, green, inelegant, in 2 or 3 small, subglobose umbels. Follicles downy. July. Per. *Green-flowered Silkweed.*

3. PERIPLO'CA.

Calyx minute; corolla rotate, flat, 5-parted, orifice surrounded by a 5-cleft, urceolate corona terminating in 5 filiform awns; filaments distinct, anthers cohering, bearded on the back; pollinia solitary, 4-lobed; follicles 2, smooth, divaricate; seeds comose.

Gr. περι, around, πλωκη; a binding or twining; from the habit of the plant. Twining shrubs or herbs. Fls. in umbels or cymes. Pollinia dilated at the apex and united to the corpuscles of the stigma, each composed of 4 confluent grains.

P. GRÆCA.

Leaves ovate, acuminate; *corymbs* axillary; *corolla* villous within. A climbing shrub, 10—15 feet long, sparingly naturalized in Western, N. Y., also cultivated in gardens. Leaves opposite, 3—4 inches long, ⅓ as wide, and on petioles ⅓ inch long. Flowers in long, branching, axillary peduncles. Sepals minute, lanceolate, acute. Petals very hairy within, linear, obtuse, dark purple. Follicles about 2 inches long. Aug.

ORDER CV. JASMINACEÆ. *The Jessamine Tribe.*

Cal.—Divided or toothed, persistent.
Cor.—Regular, hypocrateriform, limb in 5—8 divisions, twisted-imbricate in æstivation.
Sta.—2, arising from the corolla and included within its tube.
Ova.—Free, 2-celled, each cell with 1 erect ovule. *Style* 1. *Stigma* 2-lobed.
Fr.—Either a double berry, or a capsule separable into 2. *Seeds* 2.

A small order of ornamental shrubs, chiefly abounding in tropical India. Leaves simple or compound, opposite or alternate. The essential oil which pervades the order, residing chiefly in the flowers, is exquisitely fragrant. On this account, as well as for their beauty, many of these plants are cultivated.

JASMI'NUM.

Calyx tubular, 5—10-cleft; corolla hypocrateriform, tube long, limb flat, 5—10-cleft; berry double; seeds 2, solitary, ariled.

Gr. ιασμη, perfume; from the fragrance of the flowers. Shrubs, erect or twining. Lvs. evergreen. Fls. terminal.

1. J. FRU'TICANS.—Erect; *branches* angular; *leaves* alternate, trifoliate and simple, evergreen; *leaflets* obovate, obtuse, terminal ones subcuneate; *sepals* subulate. Stem 3 feet high. Flowers yellow. *Yellow Jessamine.*

2. J. OFFICINA'LE.—Climbing; *leaves* pinnate, opposite, deciduous; *leaflets* acuminate. Stems 15 feet in length. Flowers white. Both species are favorite exotics of the flower garden. The deliciously fragrant essential *oil of jasmine* of the shops is chiefly extracted from J. officinale. The flowers of *J. fruticans* are scentless. Propagated by layers. *White Jessamine.*

ORDER CVI. OLEACEÆ.

Fls.—Perfect (sometimes diœcious). Sepals united at base, persistent.
Cor.—Petals 4, united below, sometimes distinct but connected in pairs by the filaments, valvate in æstivation; rarely 0.
Sta.—2, alternate with the petals. *Anth.* 2-celled, bursting longitudinally.
Ova.—Free, 2-celled. *Ovules* in pairs, pendulous. *Style* 1 or 0. *Stigma* entire or bifid.
Fr.—Drupaceous, baccate or samaræ, usually 1-seeded by abortion.
Sds.—Albumen dense, fleshy, abundant, twice as long as the straight *embryo.*

Trees and shrubs. Leaves opposite, simple, sometimes pinnate. Natives of temperate climates. The ash is very abundant in N. America. The Philerias and the Syringas are all Oriental.

Properties. *Olive oil* is expressed from the pericarp of the *olive* (Olea Europæa). The bark of this tree, and also of the ash, is bitter, astringent and febrifugal. *Manna*, a sweet, gentle purgative, is the concrete discharge of several species of the Fraxinus, particularly of the European F. Ornus. The species of the ash are well known for their useful timber.

Conspectus of the genera.

Flowers	colored. Tube of the corolla long.	Anthers included. Shrubs.	*Syringa.*	1
	colored. Tube of the corolla short.	Anthers exserted. Shrubs.	*Ligustrum.*	2
	green, polygamous. Trees.	Leaves pinnate. . . .	*Fraxinus.*	3

1. SYRI'NGA.

Calyx small, teeth erect; corolla hypocrateriform, tube several times longer than the calyx, limb cleft into deep, obtuse, spreading segments; stamens short, included within the tube. Capsule 2-celled, 2-valved.

Gr. συριγξ, a shepherd's pipe; from the use once made of its branches. Beautiful, Oriental, flowering shrubs, with simple, entire leaves.

1. S. VULGA'RIS.—*Leaves* cordate, very entire; *inflorescence* a thyrse. Flowers of that peculiar pale purple which is called *lilac*, numerous, dense. April. May. *Common Lilac.*

2. P. PE'RSICA.—*Leaves* ovate-lanceolate, acute and acuminate, entire, rarely pinnatifid; *flowers* in a thyrsoid panicle, larger than the former, white.

Few of us are unacquainted with these species of the lilac. Their dark green and glossy leaves, their fine clusters of white and purple flowers, their strong and peculiar fragrance, and the early appearance of the blossoms, justly entitle them to the conspicuous place they usually occupy in our shrubberies. *Persian Lilac.*

2. LIGU'STRUM.

Calyx minutely toothed; corolla tube short, limb with spreading, ovate lobes; berry 2-celled, 2—4-seeded.

Lat. *ligo*, to bind; from the use made of its shoots. Shrubs with simple leaves. Fls in terminal panicles, tetramerous. Stamens 2. Style very short. Seeds convex on one side, angular on the other.

L. VULGA'RE.

Leaves lanceolate and obovate, acute or obtuse, on short petioles; *panicle* dense, terminal. A smooth shrub, 5—6 feet high. Branches wand-like with opposite, entire, smooth, dark green leaves which are 1—2 inches long, ½ as wide, varying from obovate to elliptical, with a rounded, obtuse or acute point. Flowers small, numerous, white. Anthers large, exserted. Berries black, in conical bunches, bitter. Common in woods and thickets, N. York. Said to have been introduced from England where it is used for hedges. May, June. *Privet. Prim.*

3. FRAXI'NUS.

Flowers diœciously polygamous. *Staminate fls.* (often perfect).—Calyx 0 or 3—4-parted; corolla 0 or 4-petaled; stamens 2. *Pistillate fls.*—Calyx and corolla as the perfect; samara 2-celled, by abortion 1-seeded.

Gr. φραξις, a separation; in allusion to the easy separation of its annual layers into laminæ. Trees. Lvs. unequally pinnate. Fls. paniculate, the staminate ones densely so. Fil. short. Anth. large, with 4-furrows. Stig. cleft. Fruit compressed and leafy at the end, lanceolate, solitary, pendulous.

1. F. ACUMINA'TA. *Lam.* F. Americana. *Willd.*

Leaflets petiolate, oblong, shining, entire or slightly toothed, acuminate, glaucous beneath; *flowers* calyculate. The white ash is one of the most desirable tenants of our forests It is chiefly confined to the northern parts of the U. States and Canada. Few trees exceed it in the beauty and magnitude of its proportions. The trunk arises often more than 40 feet without a branch and then expands into a regular summit of an equal additional hight. The leaves are a foot or more in length, opposite, pinnate, consisting of about 7 leaflets. Flowers in loose panicles, the fertile ones with a calyx and the barren ones without. The wood is light, firm, elastic and durable, furnishing a most excellent timber for carriage frames, agricultural implements, pins, handspikes, bars, &c. May. *White Ash.*

2. F. SAMBUCIFO'LIA. *Muh.*

Leaflets sessile, ovate-lanceolate, serrate, rugose and shining, round-oblique at the base; *axils of the veins* villous beneath; *flowers* naked. This species is common in the northern U. S. and the British Provinces, where it is almost universally known as *black ash.* It prefers moist woods and even swamps which it sometimes almost exclusively occupies. It grows to the hight of 60—70 feet, with a diameter of 2. The bark is of a darker hue than that of

the white ash and less deeply furrowed. The buds are of a deep blue, not yellow as in the former. The leaves are a foot or more in length, of about 7 sessile leaflets, which are smooth above and red-downy on the veins beneath. The wood is purplish, very tough and elastic, but less durable than the white ash. The young saplings are in great requisition for hoops, and the mature trunks for baskets. May. *Black Ash.*

3. F. TOMENTO'SA. *Muh.*

Leaflets petiolate, elliptical-ovate, acuminate, serrate, covered with a dense tomentum beneath, as well as the *petioles* and *branchlets; flowers* calyculate. The red ash is abundant in Penn. and the southern parts of N. England, resembling the last species so as often to be confounded with it. It arises 60 feet, with a straight trunk covered with bark of a deep brown color. Leaves of about 7 leaflets, which become reddish underneath. The wood is similar to that of the white ash, and is valuable for about the same diversified uses. May. *Red Ash.*

4. F. JUGLANDIFO'LIA.

Leaflets petiolate, ovate, opaque, serrate, glaucous beneath, axils of the veins pubescent; *branches* smooth; *flowers* calyculate. A small tree, 15—25 feet high, in wet woods. Leaves 10—15 inches long, consisting of 7—15 long, rather narrow leaflets. May. *Swamp Ash.*

SUBCLASS III. APETALÆ.

Corolla none; the floral envelopes consisting of a single series of organs (calyx) only, or sometimes wholly wanting.

ORDER CVII. ARISTOLOCHIACEÆ. *The Snake-root Tribe.*

Cal.—Tube adherent to the ovary, segments 3, valvate in æstivation.
Sta.—6—12, epigynous or adhering to the base of the short and thick styles.
Ova.—3—6-celled. *Stigmas* radiate, as many as the cells of the ovary.
Fr.—Capsule or berry, 3—6-celled, many-seeded.
Embryo minute, in the base of fleshy albumen.

Herbs or shrubs, the latter often climbing. Leaves alternate, simple, petiolate, often with stipules. They are most abundant in the tropical countries of S. America, and thinly diffused throughout the northern hemisphere.

Properties. Tonics and stimulants. Both the following species are successfully employed in medicine.

1. ASA'RUM.

Calyx campanulate; stamens 12, placed upon the ovary; anthers adnate to the middle of the filaments; style very short; stigma 6-rayed; capsule 6-celled, crowned with the calyx.

Etymology obscure, said to be from the Greek α, privative, and σειρω, to bind; because *not* used in garlands. Herbs, with creeping rhizomas and 1—2 leaves on each branch. Fls. solitary.

A. Canade'nse.

Leaves 2, broad-reniform; *calyx* woolly, deeply 3-cleft, the segments reflected. A small, acaulescent plant, growing in rich, shady soil. The leaves are radical, large, 2—4 inches long and 3—5 wide, with a deep sinurs at base, on long, hairy stalks, and having a soft velvet-like surface. The flower grows from between the bases of the leaf-stalks, solitary, on a nodding peduncle, and is close to the ground, sometimes even buried just beneath the surface. Calyx purplish, of 3, broad, long-pointed divisions abruptly spreading. The 12 filaments bear the anthers on their sides just below the extremity. The root or rhizoma is aromatic, and has been considered useful in whooping-cough. May—July. Per. *Asarabacca. Wild Ginger.*

2. ARISTOLO'CHIA.

Calyx ligulate, with an inflated base and an unequal border; anthers 6, subsessile upon the style; stigma 6-cleft; capsule 6-celled, many-seeded.

Gr. αριστος, excellent, λοχιος, pertaining to parturition; in reference to the supposed medicinal properties of some of the species. Stem erect or twining.

A. Serpenta'ria.

Leaves cordate, oblong, acuminate; *stem* flexuous; *peduncles* radical. Root fibrous. Stems several, mostly simple, 6—12 inches high. Leaves entire, 3-nerved, stalked. Flower-stalks radical, bracteate, with flowers of a dull purple color. Native of the Middle and Southern States. Cultivated on account of its value in medicine. The dried root is kept in shops and has an aromatic odor like Valerian, a warm, bitter, pungent taste, some like camphor, and is stimulating, diaphoretic and tonic. Jn. Per. *Virginian Snake-root.*

ORDER CVIII. CHENOPODIACEÆ. *The Goose-foot Tribe.*

Cal.—Deeply divided, often tubular at base, imbricate in æstivation.
Sta.—From the base of the calyx, as many as its lobes or fewer, and opposite to them.
Ova.—1, with 1 ovule attached to its base within. *Styles* 2—4, rarely 1.
Fr.—A utricle. *Embryo* usually curved around fleshy albumen.

Herbs or undershrubs. Leaves alternate (rarely opposite), without stipules. Flowers inconspicuous. The species are often maritime plants, and more generally weeds, abounding in the northern temperate zone.

Properties. Some are useful for food, as the *beet, mangel-wurtzel, orache, spinach, &c.* Others contain an essential oil, which renders them tonic, antispasmodic and anthelmintic; as Chenopodium botrys, C. ambrosioides, C. anthelminticum; the latter yields the officinal *worm-seed oil.* Salsoli, Salicornia and other sea-side species yield soda from their ashes in great abundance.

Conspectus of the Genera.

Flowers	all perfect.	Stamens 5.	Fruit partly invested in calyx.	Seed lenticular.	*Chenopodium.* 7
				Seed reniform.	*Beta.* 8
			Fr. wholly invested in cal.	Lvs. subulate.	*Salsola.* 2
			Styles 1.	Leafless plants.	*Salicornia.* 1
		Stamens 1—2	Styles 2.	Leafy plants.	*Blitum.* 6
	diœcious.	Stigmas sessile.	Leaves ovate-lanceolate.		*Acnida.* 4
	Stamens 5.	Stig. on capillary styles.	Lvs. hastate-lanceolate.		*Spinacia.* 3
	polygamous.	Stamens 5.			*Atriplex.* 5

1. SALICO'RNIA.

Calyx turbinate, fleshy, closed, entire; stamens 1—2; style 1, bifid; utricle invested in the calyx, 1-seeded.

Lat. *sal* salt, *cornu*, horn; in allusion both to its locality and appearance. Salt marsh herbs, rarely shrubby, destitute of leaves.

1. S. HERBA'CEA.

Stem erect, herbaceous, spreading; *joints* compressed; *internodes* dilated upwards, truncated; *branches* numerous, opposite, light green, jointed, succulent, smooth, terminating in a spike; *spikes* lateral and terminal, tapering upwards; *flowers* small, sessile, about three on each side of the base of every joint. A leafless plant with succulent and jointed branches, about a foot high, growing abundantly on sea shores and salt marshes; also at Salina, N. York. This and other species are said to make a good pickle for the table. When burned, its ashes yield soda. Aug. Ann. *Salt-wort.*

2. S. MUCRONA'TA. *Bw.*

Low, herbaceous; *joints* quadrangular at bottom, compressed and truncate at top; *spikes* oblong, with mucronate scales. A plant of thicker structure than the preceding, but less than half its hight; has fewer branches and shorter spikes, with acute, mucronate scales. In salt marshes at Charlestown, Ms., &c. Aug. Ann.

3. S. AMBI'GUA.

Perennial, procumbent, branching; *joints* small, crescent-shaped; *spikes* opposite and alternate; *calyx* truncate; *anthers* purplish yellow; *stigmas* 2. A small species, found in the vicinity of New Bedford, Ms. *Dewey.*

2. SALSO'LA.

Calyx 5-parted, persistent, embracing the fruit with its base, and crowning it with its enlarged limb; styles 2; seed horizontal; embryo spiral.

Lat. *salsus*, salt. Salt-marsh herbs with linear or subulate leaves.

S. KALI.

Herbaceous, decumbent; *leaves* subulate, channelled, spinose, smooth? *calyx* margined, axillary. A rigid, prickly and very branching plant, of the sea-coast. Stem 1—2 feet high, diffuse. Leaves about an inch long, sessile, ending with a spine. Flowers green, succulent, sessile, bracteate. Seed cochleate, enclosed in the calyx. Aug. Used in the preparation of Soda.

β. *Caroliniana.* (*Nutt.* S. Caroliniana. *Walt*); *leaves* dilated; *calyx* with a broader margin; *stem* smooth.

3. SPINA'CIA.

Flowers diœcious. *Sterile fl.*—Calyx 5-parted; stamens 5. *Fertile fl.*—Calyx 2—4-cleft; styles 4, capillary; utricle contained within the indurated and sometimes muricated calyx.

Lat. *spina*, a prickle; on account of the spiny processes of the fruit.

S. OLERA'CEA.—*Leaves* hastate-lanceolate, petiolate; *fruit* sessile, prickly or unarmed. Native country unknown, but it has long been a common plant in gardens, and in some esteem as an esculent. Stem 1—2 feet high,

with leaves between hastate and sagittate, 2—3 inches long, and nearly half as wide, tapering at base into a long petiole. Flowers greenish, the sterile ones in a terminal-panicle, the fertile ones in dense, sessile, axillary racemes. June. July. Ann. *Spinage.*

4. ACNI'DA.

Flowers diœcious. *Sterile fl.*—Calyx 5-parted; stamens 5. *Fertile fl.*—Calyx 3-parted; stigmas 3—5, sessile; utricle 1-seeded.

Gr. α, privative, and κνίδη, the nettle; that is to say, a nettle-like plant which does not sting. Herbaceous weeds, mostly aquatic.

A. CANNABI'NA.

Leaves ovate-lanceolate; *capsules* smooth, acute-angled. In salt marshes and inland swamps. Stem furrowed, smooth, 2—4 feet high. Leaves alternate, petiolate, 2—5 inches long, tapering to a long point. Panicles axillary and terminal, with numerous small, green flowers. Aug. Ann. *Wild Hemp.*

5. A'TRIPLEX.

Flowers monœciously polygamous. *Perfect fl.*—Calyx 5-parted; stamens 5; style bipartite; utricle depressed, invested in the calyx. *Pistillate fl.*—Calyx 2-leaved; stamens 0; style and fruit as above.

Lat. *ater*, dark. Perhaps on account of its dark color.

1. A. HORTE'NSIS.

Stem erect, herbaceous; *leaves* triangular, toothed, of a uniform color both sides; *calyx of the fruit* ovate, reticulate, entire. Sparingly naturalized in cultivated grounds. Stem 3 feet or more high, with thick leaves of variable shape, and 2—3 inches long. Flowers green, in terminal, interrupted racemes or spikes. It is sometimes cultivated as a pot-herb. Jl. Ann. *Garden Orache.*

2. A. PA'TULA.

Stem spreading, herbaceous; *leaves* triangular-hastate, acuminate; *calyx of the fruit* submuricate on the disk. A very branching plant, 1—2 feet long, found in salt marshes. Stem and leaves dull green, somewhat glaucous. Lower leaves hastate, with coarse teeth, upper ones lanceolate and nearly entire. Flowers in long, terminal and axillary, interrupted racemes. Sepals of the fertile flowers triangular, studded with tubercles in the midst. Aug. Ann. *Spreading Orache.*

3. A. ARENA'RIA. *Nutt.*

Stem spreading, herbaceous; *leaves* entire, oblong-ovate, subsessile, silvery white beneath, upper ones acute or acuminate; *flowers* aggregated, axillary; *calyx of the fertile flowers* muricate, dentate, retuse. Grows on sandy shores. Stem about a foot high, reddish, angular, very branching. Lower leaves often wedge-shaped. Flowers monœcious, the sterile ones in short, dense spikes at the ends of the branches, the fertile in axillary clusters. July. Ann. *Sand Orache.*

4. A. LACINIA'TA.

Stem spreading, herbaceous; *leaves* triangular-ovate, deeply toothed, hoary pubescent beneath, lower ones opposite; *perfect flowers* tetrandrous; *calyx of the fruit* rhomboid, 3-nerved, denticulate. In salt marshes. Stem a foot

long, mostly procumbent, mealy, alternately branched. Leaves stalked, entire at base, covered with small, grayish scales. The perfect flowers in terminal, sessile clusters, their ovaries about 5. Pistillate flowers axillary, 2—3 together. July. Ann. *Frosted Sea Oruche.*

6. BLITUM.

Calyx 3-cleft, stamen 1, styles 2; seed 1, contained in the calyx which becomes a berry.

Gr. βλητου, insipid; in allusion to the fair, but ill-flavored berries. Annual, herbaceous weeds. Divisions of the cal. ovate, equal. Fil. longer than the cal., erect, setaceous. Ova. ovoid, acuminate.

1. B. CAPITA'TUM.

Leaves triangular-hastate, toothed; *heads* in a terminal, leafless spike; *fruit* consisting of the reddened flowers, appearing like strawberries, full of a purple juice, taste insipid. A weed-like plant about a foot in hight, branching, growing in fields and sometimes cultivated for borders in the flower garden. Heads of flowers sessile, near together, on the branches and summit of the stem. June. Ann. *Strawberry Blite.*

2. A. RUSCOCA'RPA.

Leaves oval-lanceolate; *capsules* obtusely angled, rugose. A tall, branching unsightly plant in similar situations with the last. Stem 6—8 feet high, angular. Flowers greenish white, in terminal and axillary spikes. Jl. Ann.

3. B. MARI'TIMUM. *Nutt.*

Leaves lanceolate, attenuate at each extremity, incisely dentate; *heads* axillary, sessile, spiked; *calyx* membranaceous. A coarse unsightly plant, in salt marshes, N. Y. Stem 1—2 feet high, very branching. Leaves fleshy, with 2 or more large teeth each side. Flowers very numerous and minute, not becoming red in fruit. Aug.

7. CHENOPO'DIUM.

Calyx 5-parted, obtusely 5-angled, free, partially enveloping the fruit; stamens 5; styles 2; utricle membranaceous; seed lenticular, vertically depressed.

Gr. χην, a goose, and πους, a foot; the leaves of some of the species resemble the webbed feet of water-fowls. Mostly annual weeds with alternate leaves.

1. C. ALBUM.

Leaves rhomboid-ovate, crowded, entire at base, the upper ones oblong, very entire; *racemes* branched, leafy, smooth. A weed, common in cultivated grounds. Stem 2—3 feet high, furrowed, smooth, branching, leaves more or less mealy as also the whole plant. Flowers numerous, small, green, in irregular, terminal, erect racemes, July—Sept. *White Goose-foot.*

2. C. RUBRUM.

Leaves rhomboid-triangular, deeply toothed and sinuate; *racemes* erect, compound, leafy. A weed in waste grounds, rubbish, &c. Stem reddish, 1½—2 feet high, with short branches, very compound, and with compact clusters of small, reddish green flowers. Leaves dark green, the upper ones small and intermixed with the flowers. July. *Red Goose-foot.*

3. C. HY'BRIDUM.

Leaves cordate, angular-toothed, acuminate; *racemes* branched, subcymose, divaricate, leafless. A weed in waste places, &c., rather taller than the

foregoing. Stem slender, 2—3 feet high, bearing a loose, branching cluster of unsightly and ill-scented flowers, remote from the leaves. Leaves bright green, with large, remote teeth and a tapering point. Jl. *Tall Goose-foot.*

4. C. ANTHELMI'NTICUM.

Leaves oblong-lanceolate, toothed; *spike* simple, slender, interrupted, leafless. A strong-scented species, said to be a good vermifuge, as both its specific and common name would imply. Stem 1½—2 feet high, its branches ending in long spikes of green, inconspicuous flowers. Aug. Per. *Wormseed.*

5. C. BOTRYS.

Leaves oblong, sinuate; *racemes* much divided. Sandy fields, &c. This plant is sometimes cultivated both on account of its fragrance, and the remarkable appearance of its compound clusters of innumerable flowers. Plant 1—3 feet high, viscid-pubescent. Leaves petiolate, the sinuses deep, giving them some resemblance to oak leaves. The branches put forth numerous leaves and short, axillary clusters on every side, forming long, leafy, cylindric, green, compound racemes, of which the central one is much the tallest. June. *Oak-of-Jerusalem.*

6. C. MARI'TIMUM.

Leaves linear, subulate, fleshy, semi-cylindrical; *flowers* in sessile, axillary clusters; *stamens* shorter than the sepals. A fleshy plant growing in salt meadows. Stem 1½—2 feet high, branching. Leaves numerous, very acute, ½—1 inch long. Flowers in axillary glomerules, green. Utricle thin and semi-transparent, containing a black and shining seed. Aug. Sept.

7. C. AMBROSIOI'DES.

Leaves lanceolate, remotely dentate; *racemes* simple, axillary, leafy. Fields and roadsides Plant rather fragrant. Stem 1—2 feet high, much branched, angular, slightly pubescent. Leaves acute at each end (the upper ones nearly linear), about 4 times as long as wide, the petioles 0—¼ inch long. Flowers green, in sessile clusters on short, erect, slender, leafy branches. Stamens exsert. Aug. Sept. *Ambrosia Goose-foot.*

8. BETA.

Calyx 5-sepaled; stamens 5; styles 2, very short, erect, with acute stigmas; seed reniform, imbedded in the fleshy calyx.

Celtic *beit*, red; the usual color of the beet. Biennial herbs, with furrowed stems and alternate leaves.

1. B. VULGA'RIS.—*Flowers* in dense, sessile, axillary clusters; *lower leaves* ovate; *root* fleshy. This useful culinary is said to grow wild in S. Europe. Besides its use in salads, pickles, soups, &c., the beet yields sugar equal to that of the cane. There are several varieties, of which the purple-leaved are the most esteemed for the kitchen, and the green-leaved for extracting sugar. Aug. *Common Beet.*

2. B. CICLA.—*Leaves* with very thick ribs; *flowers* 3, together; *roots* scarcely any. Native of Potugal. Root leaves stalked, those of the stem sessile. Flowers green, numerous, in very long spikes. A culinary plant, with very large leaves, used as a salad, &c. Aug. *Scarcity.*

β. Mangel-Wurtzel; *root* very large. Cultivated as food for cattle, for which purpose it is highly prized by many farmers.

ORDER CIX. SCLERANTHACEÆ. *The Knawel Tribe.*

Cal.—Tube ureeolate, limb 4—5-toothed.
Sta.—Inserted on the ealyx tube, and usually twiee as many as its lobes.
Ova.—1, free, 1-seeded. *Styles* 2 or 1. *Fr.* a utriele, in the hardened ealyx.
Seed pendulous from the apex of a funiculus which arises from base of cell.
Embryo eurved around farinaeeous albumen.

A small order of worthless weeds, natives of the northern hemisphere. Leaves opposite, exstipulate.

SCLERA'NTHUS.

Calyx persistent, 5 cleft. the tube contracted at the orifice; stamens 10, rarely 5 or 2; styles 2; utricle very smooth, enclosed in the calyx.

Gr. σκληρος, hard, and ανθος, flower; when in seed, the floral envelope appears hard and dry.

S. A'NNUUS.

Stem spreading, slightly pubescent; *stamens* 10; *calyx of the fruit* with acute, spreading segments. A weed in dry fields and roadsides. Stems numerous, branching, decumbent, short, ending with leafy clusters of sessile green flowers. The leaves are numerous, linear, acute, short, opposite, partially united at their basis. Flowers very small, green, in axillary fascicles. July. Ann. *Common Knawel.*

ORDER CX. AMARANTHACEÆ. *The Amaranth Tribe.*

Cal.—Sepals 3—5, dry and scarious, presistent, generally with dry, colored bracts.
Sta.—5 or some multiple of 5, distinct or monadelphous, hypogynous.
Ova.—1, free, 1 or few-ovuled. *Style* 1 or none. *Stigma* simple or compound.
Fr.—A utricle. *Seeds* pendulous. *Embryo* eurved around farinaeeous albumen.

Herbs, with opposite or alternate leaves destitute of stipules. The species are most abundant in warm latitudes. A few of them are cultivated for their richly colored, imperishable flowers. Others are worthless weeds.

Conspectus of the Genera.

Leaves	alternate.	Flowers monœcious.	*Amaranthus.*	1
		Flowers perfect, pentandrous.	*Celosia.*	3
	opposite.	Flowers perfect, pentandrous, capitate.	*Gomphrena.*	2

1. AMARA'NTHUS.

Flowers monœcious. *Sterile fl.*—Calyx 3-leaved; stamens 3—5. *Fertile fl.*—Calyx 3-leaved; styles 3; utricle bursting by a circumscissile dehiscence.

Gr. α, privative, and μαραινω, to wither; because the flowers of most of the species retain their bright colors when dead. Herbs, mostly annual, with alternate leaves. Fertile and sterile flowers in the same cluster.

* Flowers triandrous.

1. A. ALBUS.

Stem obtusely angular; *leaves* obovate, retuse; *flowers* triandrous, in small, axillary clusters. A common garden weed, 1—2 feet high, simple or branched. Leaves entire, varying from oval to obovate, emarginate, with a mucronate point, tapering to a petiole which is nearly as long as the blade, those upon the branches very small. Flowers inconspicuous, pale green, accompanied with numerous, setaceous-pointed bracts. July. *White Coxcomb.*

2. A. BLITUM.

Stem diffusely spreading; *leaves* ovate, retuse; *flowers* triandrous, somewhat spiked. A weed of similar habit with A. hybridus, spreading or prostrate. July. *Low Amaranth.*

3. A. OLERA'CEUS.

Leaves rugose, oblong, very obtuse, emarginate; *clusters* axillary, branching; *flowers* sometimes pentandrous. Stem 18—24 inches high. Jl. *Pot Amaranth.*

* * Flowers pentandrous.

4. A. HY'BRIDUS.

Stem furrowed, erect; *leaves* ovate-lanceolate; *racemes* pentandrous, decompound crowded, erect. A common weed in waste and cultivated grounds. Stem 3 feet high, or more, leaves alternate, long stalked, mostly entire, obtuse, emarginate, mucronate, the lowest ones retuse Flowers minute, in large green oblong spikes becoming at length a dull red, axillary and terminal. June—Sept. *Hybrid Amaranth.*

5. A. RETROFLE'XUS.

Leaves ovate, undulate; *branches* downy; *racemes* pentandrous, triply compound, compact, erect. Waste grounds. Stem 2 feet high. Aug. Ann. *Rough Amaranth.*

6. A. PU'MILUS.

Leaves ovate, obtuse, smooth and fleshy, often retuse; *clusters* axillary; *flowers* pentandrous; *calyx* 5-leaved, concave. Stem 8—12 inches high, with obscure, green flowers. *Dwarf Amaranth.*

7. A. HYPOCHONDRI'ACUS.—*Leaves* oblong, lanceolate, mucronate; *racemes* pentandrous, compound, compact, erect. This species is native in the Middle States, and cultivated often as a garden annual. The whole plant is dark red, 3—4 feet high, with long, plume-like clusters. *Prince's Feather.*

8. A. MELANCHO'LICUS.—*Leaves* ovate-lanceolate, colored; *racemes* axillary, peduncled, roundish. From India The whole plant purple, 18 inches high. Several other species are rarely cultivated. *Love-lies-bleeding.*

2. GOMPHRE'NA.

Bracts 5, colored, the 3 outer ones connivent, carinate; sepals 5, villous, disk (nectary) cylindric, 5-toothed; utricle circumscissile, 1-seeded.

An ancient name of obscure meaning, once applied to a species of Amaranthus. Herbs and shrubs with opposite leaves. None of the species native.

1. G. GLOBO'SA.—*Stem* erect, hairy; *leaves* oblong, pubescent; *heads* globose, solitary, 2-leaved; *keels of the bracts* winged. A tender annual from India, valued for its heads of flowers, which, if gathered before too far advanced, will retain their beauty several years. Hight 18 inches. Branches opposite, axillary. Flowers purple. *Globe Amaranth.*

2. G. PERE'NNIS.—*Leaves* lanceolate; *heads* 2-leaved; *flowers* distinguished by a peculiar calyx. Plant about 2 feet high, native of S. America. The heads, 2-leaved and terminal, resemble heads of clover. The crowded, purple perianths are chiefly conspicuous. Gathered like the former species, its flowers are equally fadeless and durable. Jl.—Oct. *Perennial Globe Amaranth.*

3. CELO'SIA.

Sepals 3—5, colored; stamens united at base by a plicate disk (nectary); style 2—3-cleft; utricle circumscissile.

Gr. κηλεος, burnt; because some of the species appear as if they were singed. A genus of ornamental foreign herbs. Leaves mostly alternate.

C. CRISTA'TA.—*Leaves* ovate, acuminate; *stipules* falcate; *common peduncle* striated; *spike* oblong, compressed. This curious annual is said to have come from Japan where the flowers, or crests, are a foot in diameter, and of an intense, purplish red. Hight 2 feet. Jn.—Sept. *Cock's-comb.*

ORDER CXI. NYCTAGYNACEÆ. *The Four-o'clock Tribe.*

Cal.—Colored, tubular, the upper part resembling a corolla with a plaited limb, falling off from the lower part which becomes indurated in fruit.
Sta.—Hypogynous, definite. *Anth.* 2-celled.
Ova.—Free, with a single, erect ovule. *Style* 1. *Stigma* 1.
Fr.—A thin utricle, enclosed within the enlarged and persistent calyx.
Seed with its testa coherent with the utricle. *Cotyledons* leafy.

Herbs or shrubs. Leaves opposite. Natives of warm latitudes. Nearly all, except the following beautiful genus, are obscure weeds. Roots purgative.

MIRA'BILIS.

Characters essentially the same as those of the order.

Latin, signifying wonderful or admirable; on account of the fragrance and beauty of some of the species.

1. M. JALA'PA.—*Leaves* smooth; *flowers* in clusters, stalked. This well known and much admired plant is from the West Indies. Root large, tuberous, and is one of the substances which furnish the Jalap of the shops. Stem 2 feet high. Leaves opposite, cordate, acuminate. Flowers large, very fragrant, in axillary and terminal clusters; border wide-spreading, opening at about 4 o'clock, P. M. Calyx bright purple. By cultivation it sports into many pleasing varieties with yellow and white, red and white, red and yellow flowers. June—Sept. Per. *Four-o'clock. Marvel of Peru.*

2. M. DICHO'TOMA.—*Flowers* sessile, erect, axillary, solitary. From Mexico. Stem 2 feet high, dichotomous, with yellow flowers, opening at 4 o'clock like the former. July, Aug. *Mexican Four-o'clock.*

3. M. LONGIFLO'RA.—*Leaves* pubescent; *flowers* crowded; *tube of the calyx* very long. Native of Mexico. Stem 2 feet high. Tube of the calyx slender, hairy, twice as long as the leaves. Flowers white. June—Sept. *Long-flowered Four-o'clock.*

ORDER CXII. POLYGONACEÆ. *The Buck-wheat Tribe.*

Cal.—Sepals united at base, imbricate in æstivation.
Sta.—Definite, inserted on the calyx near the base.
Ova.—Free, with a single erect ovule. *Styles* or *stigmas* several.
Fr.—Achenium usually triangular.
Sds.—Embryo generally on one side of farinaceous albumen.

Herbs with alternate leaves. Stipules of that remarkable kind, called *ochræ*, forming sheaths around the stem above the bases of the leaves. The species are widely diffused throughout the world.

Properties. The *roots* of these plants are nauseous and purgative. *Rhubarb* of the shops is the root of some unknown species of this order, native of Tartary. But the *leaves* and *stalks* of sorrel, the garden rhubarb, &c., are agreeably tart, and contain oxalic acid; the petioles of the latter, together with the farinaceous seeds of the buck-wheat, are well known articles of food.

Conspectus of the Genera.

Sepals	6. Stigmas 3, multifid. 3 outer sepals smaller.	*Rumex.*	2
	6. Stamens 9. Stigmas multifid.	*Rheum.*	3
	mostly 5, united at base, persistent and enclosing the fruit.	*Polygonum.*	1

1. POLY'GONUM.

Calyx 4—6-sepaled, resembling a corolla; stamens 5—9, mostly 8; styles 2—3; achenia mostly triangular, enclosed in the calyx.

Gr. πολυς, many, and γονυ, knee; that is, with many joints. Herbs with jointed stems. Fls. in axillary and terminal fascicles and spikes. Ova. triangular or compressed. Styles generally 3, 2 in some species, very short, filiform.

* Flowers axillary. Stamens 5—8. Stigmas 3. POLYGONUM *verum.*

1. P. AVICULA'RE.

Stem procumbent; *leaves* elliptical-lanceolate, rough-edged, acute, sessile; *flowers* subsessile. A common weed in fields, highways and door-yards. Stems slender, ½—1¼ foot long, striate, smooth, branching, with short, white, torn, remotely nerved stipules at the joints. Leaves smooth except the edges, ½—1 inch long and ¼ as wide. Flowers reddish, small, 2 or 3 together in the axils of the leaves, appearing all summer. Ann. *Knot-grass.*

β. *glaucum* (P. glaucum. *Nutt.*); *leaves* fleshy, glaucous, revolute on the margin. Grows on the sea-coast. Long Island.

2. P. ERE'CTUM. P. aviculare. β. latifolium. *P.*

Stem mostly erect, branched; *leaves* smooth, broadly oval, petiolate; *flowers* pedicellate; *stamens* mostly 5. A species remarkably distinct in appearance from the last, in similar situations, but seldom growing with it. Stem 1—2½ feet high, branched, smooth. Leaves 1—2 inches long and about ½ as wide, rather obtuse, the petioles 0—¼ inch long Flowers 2—3 together, pedicellate, in the axils of the leaves, yellowish. Jn.—Sept Per.? *Erect Knot-grass.*

3. P. TE'NUE.

Stem slender, erect, branched, acute-angled; *leaves* linear-lanceolate, erect, acuminate; *stipules* tubular, villose at top; *flowers* alternate, subsolitary, axillary. A small, slender plant, on rocky soils, Sugar-loaf Mt., &c. Stem ½—1 foot high. Leaves 1—1½ inch long, 1—2 lines wide, 3-nerved, sessile. Flowers white. July, Aug. Ann. *Slender Polygonum.*

* * Flowers in axillary or terminal spikes. Stamens 5—8. Stigmas mostly 2. PERSICARIA.

4. P. PUNCTA'TUM. *Ell.* P. Hydropiper. *Mx.*

Stem branched, often decumbent at base; *leaves* lanceolate, punctate with pellucid dots, waved and scabrous on the margin; *spike* loose, interrupted, drooping; *stamens* 6—8; *styles* 2, united half way up. A plant well known for its acrid taste, growing in ditches, low grounds, among rubbish, &c. Stem smooth, swelling above the joints, 2 feet high, and, like the leaves, sprinkled with glandular dots in which the acrimony is said to reside. Leaves 2—3 inches long and not more than a fifth as wide. Flowers green, tinged with purple and white. Aug. Sept. Ann. *Water Pepper.*

5. P. MITE. *Pers.* P. hydropiperoides. *Mx.*

Stem mostly decumbent at base, erect and hairy above; *leaves* narrow, lanceolate, subhirsute; *stipules* hirsute, long-ciliate; *spikes* linear; *bracts* ciliate, subimbricate; *stamens* 8; *styles* 3. Ditches and ponds. Stem a foot or more high. Leaves 2—4 inches long, one fifth as wide, sessile. Spikes several, crowded near the summit of the stem, composed of small fascicles of reddish flowers. July, Aug. Ann. *Mild or Tasteless Knot-grass.*

6. P VIRGINIA'NUM.

Stem simple, angular, hairy above; *leaves* broad-lanceolate, acuminate; *spikes* virgate; *flowers* remote; *calyx* unequally 4-parted; *stamens* 5; *styles* 2, unequal. A large, erect species. Stem 3 feet high, with hairy stipules at the nodes. Leaves ovate-lanceolate, 3—5 inches long, $\frac{1}{2}$ as wide, serrate-ciliate, on short petioles. Flowers white, small, in very long, wand-like spikes. Woods. June, July. Per. *Virginian Knot-grass.*

7. P. PENNSYLVANI'CUM.

Stem smooth, tumid at the joints; *leaves* lanceolate, petiolate; *stipules* glabrous, not ciliate; *spikes* oblong, crowded; *peduncles* hispid; *stamens* 8; *styles* 2 or 1. Margins of ponds and ditches. Stem geniculate, branched above, 2—4 feet high. Leaves 3—5 inches long, $\frac{1}{3}$ as wide, slightly scabrous. Spikes short and dense, large, and somewhat nodding. Flowers large, rose-colored, pedicellate. July. Ann. *Knee Knot-grass.*

8. P. LAPATHIFO'LIUM. *L.* P. incarnatum. *Ell.*

Stem geniculate, smooth; *leaves* ovate-lanceolate, petiolate, often hoary beneath; *spikes* numerous, rather crowded, erect, on scabrous peduncles; *stamens* 6; *styles* 2. A rare species in swamps and ditches, N. Y. Stem 2—4 feet high. Leaves 3—5 inches long, $\frac{1}{3}$—$\frac{1}{2}$ as wide. Petioles $\frac{1}{4}$—$\frac{1}{2}$ inch long. Flowers small, white or tinged with red, in numerous, panicled spikes. Aug. Ann.

9. P. PERSICA'RIA.

Stem erect; *leaves* lanceolate, the upper surface spotted; *stipules* fringed; *spikes* dense, oblong, erect; *peduncles* smooth; *stamens* 6; *styles* 2, half united. A common species about buildings, fences, wet grounds, &c. Stem smooth, branched, leafy, 1—2 feet high, often colored. Leaves 2—4 inches long and $\frac{1}{4}$ as wide, entire, short stalked, acuminate, generally marked with a brownish, heart-shaped spot near the middle. Flowers rose-colored, in short, dense, terminal spikes. Jn. Aug. Ann. *Spotted Persicaria.*

10. P. ORIENTA'LE.

Stem erect, paniculately branched; *leaves* large, with hairy, salver-form stipules; *stamens* 7; *styles* 2. Native of the East, naturalized in fields and roadsides. A tall, showy plant, often cultivated for ornament. Stem 5—8 feet high. Leaves 4—6 inches long, $\frac{1}{2}$ as wide, ovate, acuminate. Spikes numerous, large, red, plume-like, terminal. Aug. Ann. *Prince's Feather.*

11. P. AMPHI'BIUM. *L.* P. coccinium. *P.*

Stem suberect; *leaves* oblong-lanceolate, acuminate at apex, obtuse or subcordate at base, rough-edged; *spike* short, dense; *stamens* 5; *styles* 2, half united. Native of ponds, ditches, and muddy grounds. Stem thick, erect, declining at base and rooting at the lower joints, 1—3 feet long. Stipules tubular, smooth, often torn. Leaves lanceolate, 4—6 inches long, $\frac{1}{4}$ as wide, scabrous on the midrib, nerves and margin. Flowers large, rose-red, in beautiful, dense spikes. Aug. Per. *Amphibious Polygonum.*

β. natans (*Hook.* P. natans. *Ea.*); *stems* 3—10 feet long, spreading on the surface of the water; *leaves* ovate-lanceolate, cordate, smooth, margin ciliate; *spikes* cylindric-oblong.

* * * Flowers in terminal, solitary spikes. Stamens 9. Stigmas 3. BISTORTA.

12. P. VIVI'PARUM.

Stem simple; *leaves* linear-lanceolate, revolute at the margin; *spike* linear, solitary. Stem erect, leafy, ½ foot high, bearing a single spike of white flowers which are often transformed into bulblets while on the stem. Leaves 1—1½ inch long, 2—3 lines wide, with entire, obtuse, smooth stipules. White Mts. July. *Alpine Bistort.*

* * * * Flowers in panicled spikes. POLYGONELLA.

13. P. ARTICULA'TUM.

Stem erect; *leaves* linear; *spikes* panicled, filiform; *flowers* solitary, pedunculated, with imbricate, truncated bracts; *stamens* 8; *styles* 3. Found in dry, hilly pastures. Stem slender, branching, straight, with numerous, racemed spikes, and imbricate, sheathing bracts. Leaves ½—1 inch long and 1—2 lines wide, obtuse. Flowers flesh-colored, on nodding, hair-like peduncles issuing from above the bracts. Achenia acutely triangular. Aug. Ann. *Jointed Polygonum.*

* * * * * Flowers in racemose panicles. Leaves subcordate or sagittate. FAGOPYRUM.

14. P. SAGITTA'TUM.

Stem prostrate, rough-angled; *leaves* sagittate; *flowers* capitate; *stamens* 8; *styles* 3. Wet grounds. A rough, climbing species, often several feet in length. Stem square, the angles very rough with prickles pointing downwards. Leaves acute, 1—3 inches long, ½ as wide, on petioles ¼—¾ inch long, with smooth stipules. Flowers in small, terminal heads, whitish. June. Ann. *Scratch-grass.*

15. P. ARIFO'LIUM.

Stem aculeate with reversed prickles; *leaves* hastate; *spikes* few-flowered; *flowers* distinct; *stamens* 6; *styles* 2. Wet grounds. Distinguished from the last chiefly by its larger, halbert-shaped leaves, which are 2—4 inches long and ½ as wide. Petioles ½—1 inch long. Clusters racemose, slender, loose, few-flowered, at the ends of the branches. Jn., Jl. Ann. *Hastate Knot-grass.*

16. P. CONVO'LVULUS.

Stem twining, angular; *leaves* cordate-hastate; *segments of the calyx* obtusely keeled; *stamens* 8; *styles* 3. A common climbing species, in fields and waste grounds. Stem 2—6 feet long, roughish, angled, with axillary branches. Leaves 1—2 inches long, ½ as wide, on petioles ¼—¾ inch long, with somewhat spreading and acute lobes at base. Flowers whitish, in terminal, interrupted spikes. June—Sept. Ann. *Knot Bind-weed.*

β. cilinode (P. cilinode. *Mx*); *plant* minutely pubescent; *stipules* fringed with reflexed hairs at base.

17. P. SCANDENS.

Stem twining, smooth; *leaves* cordate, acuminate; *segments of the calyx* winged; *stamens* 8; *styles* 3. Stem 3—7 feet long, climbing, often colored and with axillary branches. Leaves heart-shaped, with distinct, rounded lobes. Flowers in long, interrupted racemes. Calyx and fruit conspicuously 3-winged, the wings decurrent on the slender, jointed pedicels. Aug. Per. *Climbing Knot-grass.*

18. P. FAGOPY'RUM.

Stem erect, smooth; *leaves* cordate-sagittate; *racemes* panicled; *stamens* 8; *styles* 3; *angles of the achenium* equal. The name from the Lat. *fagus*,

beech, and *pyrum*, a pear; the fruit resembles in shape a beech-nut. Native of Asia, but here naturalized. A valuable grain cultivated for the flour which is made into *pan-cakes* and eaten warm. Stems 2—4 feet high. Lvs. 2—4 in. long, ½ as wide. Fls. numerous, white, very grateful to bees. *Buck Wheat.*

2. RUMEX.

Calyx persistent, of 6 colored sepals, the outer 3 smaller; stamens 6; styles 2; stigmas many-cleft; achenium 3-cornered, covered by the 3 inner valve-like sepals.

The ancient Latin name. Herbs, with flowers in dense, fasciculate panicles, terminal and axillary. Fil. very short. Styles spreading, standing out between the inner sepals.

* Flowers all perfect. Valves (inner sepals) granuliferous. LAPATHUM.
† Valves entire.

1. R. CRISPUS.

Leaves lanceolate, waved, acute; *valves* (inner sepals) *of the calyx* entire, ovate, each bearing a tubercle. A weed so common as hardly to need description, growing in cultivated grounds, about rubbish, &c., much to the annoyance of the farmer. Stem 2—3 feet high, smooth, channeled, from a yellow, fusiform root. Flowers numerous, in a large panicle, consisting of many racemes of half-whorls, interspersed with leaves. Calyx-valves 3, enclosing the seed, each with a grain on the back. The root is used in medicine for cutaneous diseases. June. Per. *Yellow-dock.*

2. R. SANGUI'NEUS.

Leaves petiolate, cordate, lanceolate; *valves of the calyx* entire, one of them principally bearing the granule. Stem of a reddish color, branching, leafy, 2—3 feet high. Leaves smooth, radical ones large, mostly with red veins, somewhat cordate, slightly curled at the edges. Flowers in small, distant whorls. Grows in waste and shady places. Introduced. July. Per. *Bloody-veined Dock.*

3. R. BRITTA'NICUS.

Leaves broad-lanceolate; *joints* with nearly obsolete, torn sheaths; *flowers* polygamous; *valves* entire, all bearing granules. Aquatic, growing in muddy places. Root yellow internally, large. Stem 3 feet high, furrowed, angular and branched. Leaves large, petiolate, acute. Flowers in verticillate fascicles, collected into a large, terminal panicle. Pedicels nodding in fruit. Calyx valves large, cordate. July. Per. *Water Dock.*

4. R. VERTICILLA'TUS.

Leaves oblong-lanceolate; *valves* entire, all bearing granules; *spikes* leafless, with flowers in half-whorls. An aquatic species of muddy situations. Stem 2 feet high, with long, tubular sheaths and few branches. Leaves long, narrow, acute, flat. Whorls few-flowered. Pedicels ½—1 inch long. June. Per. *Naked-spiked Dock.*

5. R. AQUA'TICUS.

Leaves lanceolate, acute, lower ones cordate, on long petioles; *valves* ovate, entire, all of them bearing granules. Ponds and ditches. Root large, very astringent. Stem 3—4 feet high. Leaves somewhat glaucous, the lower ones distinctly cordate at base. Flowers verticillate, in a terminal, leafy panicle. Pedicels nodding. *Great Water Dock.*

† † Valves toothed.

6. R. ACU'TUS.

Leaves oblong-cordate, acuminate; *whorls* leafy; *valves* oblong, subdentate, all of them bearing granules. Ditches and waste places. Stem 2—3 feet high. Leaves large, the lower ones distinctly cordate, on long petioles. Racemes paniculate, composed of dense, leafy, dimidiate verticels. Granules large, red, one upon the back of each valve. May. Introduced. *Dock.*

7. P. PA'LLIDUS. *Bw.*

Leaves linear-lanceolate, acute; *spikes* slender; *valves* ovate, entire, hardly larger than the granule. Found in salt marshes, Ms. Stems numerous, ascending. Leaves smooth, acute, petioled, wavy on the margin. Flowers crowded, on short pedicels. Granule large, white, nearly covering the back of each valve. June. Per. *White Dock.*

8. R. OBTUSIFO'LIUS.

Stem roughish; *radical leaves* ovate, obtuse; *valves* toothed, one of them principally bearing a granule on the back. A weed as troublesome as the first, growing about houses and fields wherever it is least welcome. Stem 2—3 feet high, furrowed, branching, leafy. Leaves oblong, cordate, obtuse, crenate-wavy; upper ones narrower and more acute; root leaves very large, oblong, heart-shaped, often with stalk and veins red. Flowers in long, nearly naked racemes. July. Per. Introduced. *Broad-leaved Dock.*

* * Flowers diœcious. Valves without granules. ACETOSA.

9. R. ACETOSE'LLA.

Leaves lanceolate-hastate; *flowers* diœcious. A common weed, growing in pastures and waste grounds throughout the U. S., preferring dry, hard soils. Stem $\frac{2}{3}$—1 foot high, leafy. Leaves halbert-shaped, very acid, but pleasant to the taste. Flowering all summer. Flowers small, red or reddish, collected in panicled racemes, the valves destitute of granules. The stamens and styles are on separate plants. Per. *Field Sorrel. Sheep Sorrel.*

3. RHEUM.

Calyx colored, 6-sepaled, persistent; stamens 9; styles 3; stigmas multifid, reflexed; achenia 3-angled, the angles margined.

The name comes from *Rha*, the ancient name of the river Volga, on the banks of which it was first discovered. Herbs. Fls. fascicled, in racemose panicles.

R. RHAPO'NTICUM.—*Leaves* smooth, cordate-ovate, obtuse; *petioles* channeled above, rounded at the edges. Native of Asia, cultivated in gardens for the sake of the juicy, acid petioles. These are taken in a green state, in the spring of the year, and made into tarts and pies, whose excellence is well known to every one. Stem stout and fleshy, 3—4 feet high, hollow, with large, sheathing stipules at the joints. Leaves very large, 1—2 feet long, $\frac{2}{3}$ as wide, on petioles of nearly the same length. Panicle terminal, at first enclosed in a white, membranous bract which at length bursts, disclosing innumerable greenish white flowers. May. Per. *Garden Rhubarb or Pie-plant.*

ORDER CXIII. PHYTOLACCACEÆ. *The Garget-poke Tribe.*

Cal.—Sepals 4—5, petaloid.
Sta.—4—5 and alternate with the sepals, or indefinite.
Ova.—1—several-celled. *Styles* and *stigmas* equal in number to the cells.
Fr.—Baccate or dry. *Seeds* solitary, ascending.
Embryo cylindric, curved around fleshy albumen.

A small order, of which the Phytolacca decandria is our only representative. Leaves alternate, entire, exstipulate. P. decandria possesses active properties, but they appear to be yet little understood, and of doubtful application.

PHYTOLA'CCA.

Calyx 5-sepaled, resembling a corolla; stamens 7—20; styles 5—10; berry superior, 10-celled, 10-seeded.

Gr. Φυτον, a plant, and Lat. *lacca*, lac; because the plant produces berries with a fine purple juice resembling lac. Racemes often opposite the leaves.

P. DECA'NDRIA.

Leaves ovate, acute at both ends; *flowers* with 10 stamens and 10 styles. A common, well known plant, growing about roadsides, hedges, &c. Root very large and branching. The stem, with the diameter of an inch, is 5—8 feet high, round, smooth, branching, and when mature, of a fine, deep purple. Leaves 5 inches long, 2—3 broad, smooth, of a rich green color, entire and petioled. Racemes cylindric, long, at first terminal, becoming finally opposite to the leaves. Flowers greenish white, consisting of 5 ovate, concave sepals, 10 stamens with white, 2-lobed anthers, and 10 short, recurved styles. The fruit is a dark purple berry, of a round, depressed form. The juice of the berries stains paper and linen a beautiful purple color, which, however, is not durable. In Spain, it is said they are used to color wine. July—Sept. Per. *Poke. Garget. Jalap.*

ORDER CXIV. LAURACEÆ. *The Cinnamon Tribe.*

Cal.—Sepals 4—6, somewhat united, free from the ovary, imbricated in 2 series. [ing.
Sta.—Definite, perigynous, usually twice as many as the sepals, the 3 inner sterile or want-
Anth.—Adnate, 2—4-celled, opening, by recurved valves, from the base to the apex,
Ova.—*Style* and *stigma* single. [conspicuous, 2-leaved.
Fr.—Berry or drupe on a thickened pedicel. *Seed* large, without albumen. *Plumula*

Trees and shrubs. Leaves alternate, entire, exstipulate. Chiefly natives of the tropics, but few being sufficiently hardy to endure our climate.

Properties. The species of this highly important order are throughout pervaded by a warm and stimulant aromatic oil. *Cinnamon* is the dried bark of Cinnamomum Zeylanicum, of Ceylon, &c. *Camphor* is obtained from many trees of this order, but chiefly from *Camphora* officinarum, of Japan, China, &c. *Cassia Bark*, from Cinnamomum aromaticum of China. Persea gratissima, a tree of the W. Indies, yields a delicious fruit called the *Avocado pear.* Both of the following species are also moderately medicinal.

LAURUS.

Calyx regular, 4—5-parted; stamens 8—12, arranged in a double series, the outer ones all fertile, alternate inner ones fertile and appendaged at base with 2 glands (nectaries); drupes fleshy, 1-seeded.

Celtic, *blaur* (pronounced *laur*), green; the *Laurel* is perpetually green. A noble genus of trees and shrubs. Fls. diœcious-polygamous. Cal. like a cor. Sta. generally in 2 series of 6 each, 3 of the inner series being barren.

1. L. BENZO'IN. *L.* Benzoin odoriferum. *Nees.*

Leaves obovate-lanceolate, nerveless entire, deciduous; *flowers* in clustered umbels, often diœcious; *buds* and *pedicels* smooth. A shrub 4—7 feet in hight, in moist woods. It has an aromatic flavor resembling gum Benzoin, and the bark an agreeable, spicy taste. Leaves oval or obovate, cuneiform and acute at base, 2—4 inches long and ½ as wide, paler beneath. Flowers pedicellate, in small, sessile umbels, greenish, appearing in advance of the leaves. Calyx 6-cleft, with oblong segments. Berries red. May.
Fever Bush. Spice Wood.

2. L. SA'SSAFRAS. *L.* Sassafras officinale. *Nees.*

Leaves deciduous, both entire and lobed; *flowers* diœcious; *buds* and *pedicels* silky pubescent. The sassafras tree is not uncommon in N. England, and very abundant in the forests of the Western States. It varies in hight from 10 to 40 feet. Leaves alternate, petioled, those of the young shoots ovate-lanceolate, others with 3 large lobes. Flowers greenish yellow, appearing in May and June, in clustered racemes at the end of the last year's twigs, and after the leaves have expanded. Every part of the tree has a pleasant fragrance, and a sweetish, aromatic taste, which is strongest in the bark of the root. These qualities depend upon an essential oil which may be obtained by distillation, and which has been highly valued in medicine. The young shoots are a common ingredient in *small beer*, imparting to it a grateful flavor. *Sassafras.*

ORDER CXV. SANTALACEÆ. *The Sandel-wood Tribe.*

Cal.—Tube adherent to the ovary, limb 4—5-cleft, valvate in æstivation.
Sta.—As many as the sepals, inserted at their base and opposite to them.
Ova.—1-celled, 1—4-ovuled. *Style* 1. *Stigma* often lobed.
Fr.—Hard, dry and drupaceous, 1-seeded, crowned with the persistent calyx.

Trees, shrubs and herbs. Leaves alternate and entire. Natives of Europe, America, Australasia, &c. The fragrant *sandel-wood* is the product of Santalum album, &c., of India.

Genera.

Suffruticose, smooth herbs, with perfect flowers.	*Comandra.*	1
Trees with polygamous flowers.	*Nyssa.*	2

1. COMA'NDRA.

Calyx somewhat urceolate, tube adherent, limb 4—5-parted; stamens 4—5 opposite the sepals, inserted into the top of the tube; disk perigynous, 5-lobed, the lobes alternating with the stamens. Fruit drupaceous, 1-seeded, crowned with the limb of the calyx.

Gr. κομη, hair, ανδρες, stamens; in allusion to the tuft of filaments by which each anther is connected to the opposite sepal in some of the species. Very smooth, suffruticose plants of N. America. Peduncles axillary and terminal. Fls. small, umbellate.

C. UMBELLA'TA. *Nutt.* Thesium umbellatum. *L.*

Erect; *leaves* oval-lanceolate; *flowers* subcorymbed, terminal. Plant about a foot high, in rocky woods. Stem slender, striate, generally branching at top. Leaves entire, alternate, acutish, 1—1½ inch long and ⅓ as wide, tapering to a very short petiole. Flowers small, white, in little umbels of about 3. Each umbel is furnished with a deciduous involucre of about 4 small leaflets, the whole constituting a kind of corymb. Each anther is attached to its opposite sepal by several hair-like, yellow filaments. Jn. Per. *Bastard Toad-flax.*

2. NYSSA.

Flowers diœcious-polygamous. *Sterile fl.*—Calyx 5-parted; stamens 5—10, inserted around a glandular disk; pistil 0. *Fertile fl.*—Calyx 5-parted; stamens 5 or 0; pistil 1; drupe inferior; nut 1-seeded.

The name of a nymph, according to Linnæus. Trees.

1. N. MULTIFLO'RA. *Walt.* N. Villosa. *Mx.*

Leaves oblong, obovate, very entire, acute at each end, the petiole, midrib and margin villous; *fertile peduncles* 3—6-flowered; *nut* short, obovate, obtuse, striate. This tree is disseminated throughout the U. S. In swamps it is found 30—50 feet high, the trunk 1—1½ foot in diameter, with horizontal branches forming a pyramidal summit. The bark is light gray, similar to that of the white oak. Leaves tough and firm, 2—5 inches long, and ½ as wide. Flowers small, greenish, in small clusters on a long, branching peduncle, the fertile ones succeeded by a few deep blue, oblong drupes. The wood is white, fine-grained, rather soft, the texture consisting of interwoven bundles of fibres, rendering it very difficult to split. It is therefore useful for beetles, naves of wheels, hatters' blocks, &c. Jn. *Pepperidge. Tulepo. Sour Gum.*

2. N. BIFLO'RA. *Walt.* N. aquatica. *L.*

Leaves oblong-ovate, entire, acute at both ends, smooth; *fertile peduncles* 2-flowered; *drupe* short, obovate; *nut* striate. This tree grows in swamps, in certain sections of the Northern and Middle States. The trunk when full grown is 30—50 feet high and 15—20 inches in diameter, the bark divided by deep furrows into hexagons. Leaves alternate, smooth, 2—4 inches in length. Flowers small and obscure. the fertile ones producing a fruit of a deep blue color, growing in pairs on a common stalk which is shorter than the leaves. The wood is dark brown, similar in quality and uses to the last. June.

Water Tulepo or Gum Tree.

ORDER CXVI. THYMELACEÆ. *The Mezereum Tribe.*

Cal.—Free, tubular, colored, limb 4 (rarely 5)-cleft, imbricated in æstivation.
Sta.—Definite, inserted into the calyx and opposite to its lobes when equal to them in number; often twice as many.
Ova.—Solitary, with 1 ovule. *Style* 1. *Stigma* undivided.
Fr.—Hard, dry, drupaceous. *Albumen* 0 or thin.

Shrubs, with a very tenacious bark. Leaves alternate or opposite, entire. Flowers perfect. The species are very abundant in Australasia and S. Africa, sparingly disseminated in Europe and Asia. The only North American genus is that which follows.

Properties. The bark is acrid and caustic, raising blisters upon the skin. It is composed of interlaced fibres which are extremely tough, but easily separable. The lace-bark tree (Lagetta) of Jamaica is particularly remarkable for this property.

DIRCA.

Calyx colored, tubular, with an obsolete limb; stamens 8; unequal, longer than, and inserted into, the tube; style 1; berry 1-seeded.

Gr. δίρκα, a fountain; the shrub grows in wet places. Lvs. alternate, simple. Fls. expanding before the leaves.

D. PALU'STRIS.

Leaves oblong-ovate or obovate; *flowers* axillary, 2—3 in a hairy, bud-like involucre. A shrub, 5 feet in hight, when full grown. The flowers appear

in April and May, much earlier than the leaves. They are small, yellow, funnel-shaped, about 3 together issuing from the same bud. Leaves entire, on short petioles, pale underneath. Stamens much longer than the sepals, alternately a long and a short one. Berry oval, small, red. Every part of this shrub is very tough. The twigs furnish "rods for the fool's back," the bark is used for ropes, baskets, &c. Woods and swamps, Enfield, N. Hampshire, &c. *Leather Wood.*

ORDER CXVII. ELÆAGNACEÆ.

Fls.—Generally diœcious.
STERILE FL. *Cal.*—4-parted. *Sta.* 3, 4 or 8, sessile. *Anth.* 2-celled.
FERTILE FL. *Cal.*—Free, tubular, persistent, limb entire or 2—4-toothed.
Ova.—Simple, 1-celled. *Ovule* solitary, stipitate. *Stig.* simple, subulate, glandular.
Fr.—Achenium crustaceous, enclosed within the calyx which becomes succulent and baccate.
Sds.—Ascending. *Embryo* straight, in thin, fleshy albumen.

Trees and shrubs. Leaves alternate or opposite, entire, without stipules. Flowers axillary. Foliage and fruit covered with scurf.

SHEPHE'RDIA.

Flowers diœcious. *Sterile fl.*—Calyx 4-cleft; stamens 8, alternating with 8 glands. *Fertile fl.*—Calyx tube closely investing the ovary, but not adhering to it, limb 4-lobed; style 1; stigma oblique; berry globose, composed of the fleshy calyx.

North-American shrubs, with spinescent branches, and opposite, deciduous leaves. Fls. aggregated.

S. CANADE'NSIS. *Nutt.* Hippophæ Canadensis. *Willd.*

Leaves elliptic-ovate, nearly smooth above, clothed beneath with stellate hairs and ferruginous, deciduous scales. A shrub, 6—8 feet high, found in N. Y. and Vt., by streams and on river banks. Flowers minute. Berries scaly, sweetish to the taste. July.

ORDER CXVIII. ULMACEÆ. *The Elm Tribe.*

Fls.—Perfect or polygamous.
Cal.—Free from the ovary, campanulate, 4—5-cleft, imbricate in æstivation.
Sta.—Inserted on the base of the calyx, as many as its lobes, and opposite to them.
Ova.—1—2-celled. *Ovules* solitary. *Stigmas* 2, distinct.
Fr.—Indehiscent, either a samara or drupe, 1-celled; 1-seeded.
Seed pendulous, without albumen. *Cotyledons* foliaceous.

An order of small extent, embracing trees and shrubs, with alternate, rough, simple and deciduous leaves and stipules. They are natives of the northern temperate zone. The mucilaginous bark of the *slippery elm* (ulmus fulva) is the only important medicinal product. Several of the elms afford excellent timber.

Genera.

Flowers all perfect. Calyx 4—5-cleft. Fruit samaræ.	*Ulmus.*	1
Flowers polygamous. Calyx of sterile fl. 6-parted. Fruit a drupe. . .	*Celtis.*	2

1. ULMUS.

Flowers perfect. Calyx campanulate, 4—5-cleft; stamens 5—8; styles 2; samara compressed, with a broad, membranaceous border.

From *elm*, its original name in Anglo-Saxon, Teutonic, Gothic, and other Celtic dialects.

1. U. AMERICA'NA.

Leaves ovate, acuminate, serrate, unequal at the base; *flowers* pedicelled; *fruit* fimbriate. This majestic tree is common in the Northern, Middle and Western States. It is a native of the forest, but often grows spontaneously in open fields, where it is readily distinguished by its long, pendulous branches. The trunk, with a diameter of 3—5 feet, towers to the hight of 30, 50, and even 70 feet, perfectly straight and naked, when it divides into 2 or more primary branches. These ascend, gradually spreading, and repeatedly dividing into other long, flexible limbs bending in broad, graceful curves. It is a great favorite as a shade tree, and is frequently seen rearing its stately form and casting its deep shade over the "sweet homes" of New-England. Leaves short-stalked, oval-acuminate, doubly denticulate, and 4—5 inches long. The ribs are quite regular and prominent. Flowers small, purplish, collected into small, terminal clusters, and appearing in April, before the leaves. Fruit flat, fringed with a dense down. The wood is tough and strong, but not easily wrought; used for the naves of wheels, &c. *White Elm.*

2. U. FULVA.

Branches rough; *leaves* oblong-ovate, acuminate, nearly equal at base, unequally serrate, pubescent both sides, very rough; *buds* covered with fulvous down; *flowers* sessile. Woods and low grounds. The slippery elm is much sought on account of the mucilage of the inner bark. Its diameter is 1—2 feet, and hight 20—40. The leaves are larger, thicker and rougher than those of the white elm, and exhale a pleasant odor. Flowers collected at the ends of the young shoots. Calyx downy, sessile. Stamens short, reddish, 7 in number. April. *Slippery Elm. Red Elm.*

3. U. RACEMO'SA. *Thomas.*

Leaves ovate, acuminate, auriculate on one side; *flowers* in racemes; *pedicels* in distinct fascicles, united at their base. A tree found in Vt. and N. Y. The branches are remarkably distinguished by their numerous, corky excrescences. Leaves 3—4 inches long, $\frac{2}{3}$ as wide including the auricle, doubly serrate, smooth above, ribs and under surface minutely pubescent. Flowers pedicellate, 2—4 in each of the fascicles which are collected into racemes. Calyx 7—8-cleft. Stamens 7—10. Stigmas recurved. Samara ovate, pubescent, the margin doubly fringed. *Cork Elm.*

2. CELTIS.

Flowers monœcious-polygamous. *Sterile fl.*—Calyx 6-parted; stamens 6. *Perfect fl.*—Calyx 5-parted; stamens 5; styles 2; stigmas subulate, elongated, spreading; drupe 1-seeded.

Celtis was an ancient name for the lotus, which this genus is said to resemble. Lvs. mostly oblique at base. Fls. axillary.

1. C. CRASSIFO'LIA.

Leaves ovate, acuminate, serrate, unequally cordate at base, subcoriaceous, rough both sides; *peduncles* about 2-flowered. This tree is thinly disseminated in the northern parts of the U. S. In woods it is distinguished by its straight, slender trunk, undivided to a great hight, covered with an unbroken bark. The leaves are of a thick and firm texture, very large, heart-shaped at base. Flowers small, white, succeeded by a round, black drupe about the size of the whortleberry. The wood is white and close-grained, but neither strong nor durable. May. *Hackberry.*

2. C. OCCIDENTA'LIS.

Leaves ovate, acuminate, entire and unequal at base, serrate, rough above, and rough-hairy beneath; *fruit* solitary. This species is some 30 feet high in New England, where it is rarely found, but is much more abundant at the South and West. The trunk has a rough, but unbroken bark, with numerous slender, horizontal branches. Leaves with a very long acumination, and remarkably unequal at the base. Flowers axillary, solitary, small and white, succeeded by a small, round, dull red drupe. The wood is tough and is used for making hoops, &c. *American Nettle Tree. Hoop Ash.*

ORDER CXIX. SAURURACEÆ.

Fls.—Perfect, achlamydeous. *Sta.* definite, persistent.
Anth.—2-celled, with a thick connectile continuous with the slender filament.
Ova.—Carpels 3—5, each few-ovuled.
Fr.—Capsule or berry, 3—5-celled, few-seeded. [albumen.
Seeds usually solitary in the cells. *Embryo* minute, cordate, outside of hard, farinaceous

A small order of aquatic herbs, with jointed stems. Leaves alternate, stipulate. Flowers each with a bract at base, in spikes. Properties unimportant.

SAURU'RUS.

Inflorescence an ament or spike of 1-flowered scales; stamens 6, 7, 8 or more; anthers adnate to the filaments; ovaries 4; berries 4, 1-seeded.

Gr. σαυρα, a lizard, and ουρα, a tail; from the resemblance of the inflorescence.

S. CE'RNUUS. *Willd.* Anonymous aquatica. *Walt.*

Stem angular; *leaves* cordate, acuminate, petiolate. An aquatic plant, with neat foliage, and yellowish, drooping spikes of flowers. Stem 1½—2 feet high, weak, furrowed. Leaves 4—6 inches long, and ½ as wide, smooth and glaucous, with prominent veins beneath and on petioles 1—2 inches long. Spikes slender, drooping, longer than the leaf. Scales tubular, cleft above, white. Flowers very small and numerous, sessile, consisting only of the long stamens, and the ovaries with their recurved stigmas. Aug. Per. *Lizard's tail.*

ORDER CXX. CERATOPHYLLACEÆ.

Fls.—Monœcious. *Cal.* many-parted.
STERILE.—*Sta.* indefinite (16—20). *Anth.* tricuspidate, sessile, 2-celled. [sessile.
FERTILE.—*Ova.* free, 1-celled, with a suspended, solitary ovule. *Style* filiform, oblique,
Fr.—Achenium beaked with the indurated stigma.
Seed orthrotopous, suspended, exalbuminous, and containing 4 cotyledons.

Herbs, floating. Leaves cellular, many-cleft, verticillate.

CERATOPHY'LLUM.

Character the same as that of the order.

Gr. κερας, a horn, and φυλλον, a leaf; on account of the many-horned divisions of the leaf.

C. DEME'RSUM.

Leaves 6—8 in a whorl, doubly dichotomous, dentate-spinescent on the back; *flowers* axillary; *fruit* 3-spined. An aquatic weed, in ditches, &c.

Stem floating or prostrate, 8—16 inches long, filiform, with numerous whorls of leaves. These are dichotomously divided into 2 or more filiform segments. Flowers minute, axillary, sessile, with sessile anthers. Fruit an oblong, beaked capsule, with 1 seed. July—Sept. *Hornwort.*

ORDER CXXI. CALLITRICACEÆ.

Fls.—Mostly monœcious, achlamydeous, with an involucre of 2 bracts.
Sta.—1 (rarely 2). *Filament* slender. *Anth.* 1-celled, 2-valved.
Ova.—4-celled, 4-lobed. *Styles* 2. *Stigmas* simple points.
Fr.—4-celled, 4-seeded, indehiscent. *Seeds* peltate, albuminous.

An order consisting of a single genus, Callitriche, which is both European and American. Small, aquatic herbs, with opposite, simple, entire leaves. Flowers axillary, solitary, very minute.

CALLITRI'CHE.

Character the same as that of the order.

Gr. καλος, beautiful, θριξ, τριχος, hair; alluding to the numerous, slender stems or leaves. Root annual.

C. VERNA. *Muh.* C. intermedia. *Willd.* C. aquatica. *Bw.*

Floating; *upper leaves* oblong-spathulate, *lower ones* linear, obtuse or emarginate; *capsule* with the lobes obtusely margined. This little polymorphous plant is common in shallow streams and muddy places. Stem floating, 1—2 feet long, composed of 2 tubes, simple or branched. Leaves 2 at each node, becoming crowded above into a starlike tuft upon the surface of the water, the lower ones becoming gradually narrower, and the lowest quite linear. Flowers white, axillary, 1 or 2 together, often monœcious. Anther a little exserted, yellow. May—Sept. *Water Starwort.*

β. autumnalis. (*Darl.* C. autumnalis, *L.* C. linearis. *P.*); floating; *leaves* nearly all linear, 1-nerved, truncate or emarginate, the upper ones a little dilated towards the end. In similar situations with, and generally accompanying the former.

γ. terrestris. (*Darl.* C. terrestris. *Raf.* C. brevifolia. *P.*); procumbent and diffuse; *leaves* all oblong, obtuse, crowded, fleshy. Grows on soft mud, overspreading the surface. This form evidently depends on the locality.

ORDER CXXII. PODOSTEMIACEÆ.

Fls.—Monœcious, achlamydeous, bursting through an irregularly lacerated spathe.
Sta.—Often reduced to 1 or 2, and monadelphous.
Ova.—Free, 2—3-celled. *Styles* 2 or 0. *Stigmas* 2—3.
Fr.—Capsule subpedicellate, opening by 2 valves.
Sds.—Numerous, without albumen, attached to a central column.

A small order of aquatic, moss-like herbs. Flowers inconspicuous. They are natives of America and Asia.

PODOSTE'MUM.

Stamens 2, with the filaments united below; ovary oblong-ovoid; stigmas 2, sessile, recurved; capsule 2-celled; seeds minute.

Gr. (πους) ποδος, a foot, στημον, a stamen; in allusion to the stamens being supported apparently on a common footstalk. Small, submersed aquatics, adhering to rocks and pebbles. Leaves alternate, dissected.

P. CERATOPHY'LLUM. *Mx.* Lacis ceratophylla. *Bongard.*

Leaves dichotomously dissected; *flowers* solitary, axillary. Stem a few inches long, usually destitute of roots and attached to stones by lateral, fleshy processes. Leaves numerous, alternate, coriaceous, divided into many narrow segments. Flowers on short, thick peduncles, the 2 stamens and styles at length bursting through the lacerated calyx. In shallow running streams. Mass. July. *Thread-foot.*

ORDER CXXIII. EUPHORBIACEÆ.

Fls.—Monœcious or diœcious. *Cal.* inferior, lobed, or wanting.
Cor.—Petals or scales equal in number to the sepals, or wanting.
STERILE FL.—*Sta.* definite or indefinite, distinct or monadelphous. *Anth.* 2-celled.
FERTILE FL.—*Ova.* free, of 2—9, more or less united carpels, coherent to a central prolongation of the axis. *Styles* distinct, often 2-cleft.
Fr.—Capsule of 3 dehiscent carpels which open elastically.
Sd.—With a large embryo in fleshy albumen.

A large order of herbs, shrubs or trees, often with an acrid milk. Leaves opposite or alternate, simple. They are chiefly natives of South America, not more than 50 species of its 1500 being found in N. America.

Properties. An acrid, stimulant and poisonous principle, residing chiefly in the milky juice, pervades the whole order. This principle varies in activity from mild stimulants to the most active poisons; but it is volatile and easily expelled by heat. *Tapioca* is a starch-like accumulation formed in the roots of the Jatropa Manihot. When fresh, this root is a violent poison, but loses its deleterious properties by washing and exposure to heat. *Castor-oil* is expressed from the seeds of Ricinus communis, *Croton-oil* from the seeds of Croton Tiglium. Caoutchouc is yielded in abundance by several S. American species.

Conspectus of the genera.

Herbaceous.	Lvs. undivided.	Fls. monandrous, in small, involucrate heads.	*Euphorbia.* 4
		Flowers in spikes.	*Acalypha.* 3
	Leaves peltate-palmate.		*Ricinus.* 2
Shrubs with smooth, simple, evergreen, opposite leaves.			*Buxus.* 1

1. BUXUS.

Flowers monœcious. *Sterile.*—Calyx 3-leaved; petals 2; stamens 4, with the rudiment of an ovary. *Fertile.*—Calyx 4-leaved; petals 3; styles 3; capsule with 3 beaks and 3 cells; seeds 2.

The Greek name of this plant was Πυξος. Shrubs. Leaves evergreen, opposite.

B. SEMPERVI'RENS.—*Leaves* ovate; *petioles* hairy at edge; *anthers* ovate, sagittate. Variety *angustifolia* has narrow, lanceolate leaves. Variety *suffruticosa*, the dwarf box, has obovate leaves and a stem scarcely woody, highly esteemed for edgings in gardens. The box, with its varieties is native of Europe. *Box.*

2. RI'CINUS.

Flowers monœcious. *Sterile.*—Calyx 5-parted; stamens many. *Fertile.*—Calyx 3-parted; styles 3, 2-cleft; capsules echinate, 3-celled, 3-seeded.

Lat. *ricinus*, an insect, which the fruit of these plants resemble. Herbs and shrubs with peltate, palmate leaves.

R. COMMU'NIS.—*Stem* frosted, herbaceous; *leaves* peltate, palmate, lobes lanceolate, serrate; *capsules* prickly. Native of the E. Indies, where it be-

comes a tree, although an herbaceous annual with us. From its seeds is expressed the well known castor-oil of the shops For this purpose it is extensively cultivated in many parts of the U. States. Jl., Aug. *Castor-oil Bean.*

3. ACA'LYPHA.

Flowers monœcious. *Sterile.*—Calyx 3—4-parted; stamens 8—16, united at base. *Fertile.*—Calyx 3-parted, segments connivent, persistent; styles 3, elongated, 2—3-parted; capsule 3-celled, cells 1-seeded.

The Greek name for the nettle, which this plant resembles. It is compounded of α, privative, καλος, beautiful, and αφη, touch. Herbaceous or shrubby. Lvs. alternate, stipulate.

A. VIRGI'NICA.

Pubescent; *leaves* on short petioles, oblong-lanceolate, serrate; *involucrum* cordate, ovate, acuminate, nerved and toothed. An annual, branching plant, in dry and gravelly soils. Stem erect, 12—18 inches high. Leaves 3-nerved, 2—3 inches long and $\frac{1}{3}$—$\frac{2}{3}$ as wide, obtuse, hairy. Pistillate flower at the base of the peduncle of the staminate spike. Involucrum of the fruit axillary, on a short stalk, shorter than the leaves, its margin cut half way down into long, acute segments. Aug. Ann. *Three-seeded Mercury.*

4. EUPHO'RBIA.

Flowers monœcious, mostly achlamydeous; involucre monophyllous, subcampanulate, with 4—5 petaloid segments alternating with as many external, gland-like teeth. *Sterile fl.* 12 or more; stamen 1; filament articulated in the middle. *Fertile fl.* solitary, central; ovary pedicellate; styles 3, bifid; capsule 3-lobed, 3-celled; cells 1-seeded.

Named for Euphorbus, physician to Juba, King of Mauritania, who first used these plants in medicine. Herbs or shrubs. Lvs. generally simple, sometimes wanting.

* Heads of flowers in involucrate umbels. Cauline leaves alternate.

1. E. COROLLA'TA.

Erect; *cauline* and *floral leaves* oblong, narrow, obtuse; *inner segments of the involucre* obovate, petaloid; *umbel* 5-rayed, then 3-rayed and forked. In dry fields. Stem slender, erect, 1—2 feet high, generally simple and smooth. Leaves 1—2 inches long, often quite linear, very entire, scattered on the stem, verticillate and opposite in the umbel. The umbel, as in other species, consists of about 5 verticillate branches from the summit of the stem, each of which is subdivided into 3, and finally into 2 peduncles. Corolla-like involucre large, white, showy. Jl., Aug. Per. *Large-flowered Spurge.*

2. E. HELIOSCO'PIA.

Erect; *floral leaves* obovate, *cauline ones* wedge-form, serrate, smooth; *umbel* 5-rayed, then 3-rayed and forked. A milky weed in cultivated grounds, remarkable for the symmetry of its vegetation. Stem smooth, erect, 8—16 inches high. Leaves scattered, $\frac{2}{3}$—$1\frac{1}{2}$ inch long, $\frac{2}{3}$ as broad at the rounded or retuse apex, finely and sharply serrate, entire, and tapering to the base. Umbels subtended by a large involucre of 5 obovate leaves. Each of the 5 rays is pilose with scattered hairs and subdivided into an umbellet of 3 rays with a 3-leaved involucel, and these finally into 2 or more pedicellate fascicles. Capsules smooth. Jn., Jl. Ann. *Sun Spurge.*

3. E. PLATYPHY'LLA. *L.* E. obtusata. *P.*

Erect; *leaves* alternate, sessile, spathulate, serrulate, smooth; *umbel* 3-rayed, rays twice dichotomous; *floral leaves* ovate, subcordate, somewhat obtuse; *capsules* muricate. Grows in waste grounds. Stem 12—18 inches high. July, Aug. Per.

* * Heads not umbellate. Leaves opposite.

4. E. HYPERICIFO'LIA.

Stem smooth, branching, nearly erect, branches divaricate-spreading; *leaves* opposite, oval-oblong, serrate, sub-falcate; *corymbs* terminal. A slender, branching plant, found in dry and rich soils. Stem 10—20 inches high, usually very smooth, the branches often pubescent. Leaves tripli-nerved, marked with oblong dots and blotches, ciliate, 6—12 lines long, and $\frac{1}{4}$ as wide, oblique, on very short petioles. Corymbs of small white heads, terminal and axillary. July, Aug. Ann. *Spurge. Eye-bright.*

5. E. MACULA'TA.

Procumbent; *branches* spreading; *leaves* serrate, oblong, hairy; *flowers* axillary. A prostrate plant, spreading flat upon the ground, in sandy fields. Stem 6—12 inches in length, much branched, hairy. Leaves opposite, 3—6 lines long and $\frac{1}{2}$ as wide, oblong, obtuse, serrulate, smooth above, often spotted with dark purple, the margin ciliate, pale and hairy beneath, on short stalks. Heads of flowers small, crowded near the summit, involucre minute, white. July—Sept. Ann. *Spotted Spurge.*

6. E. POLYGONIFO'LIA.

Procumbent; *leaves* entire, lanceolate and oblong, obtuse at base; *flowers* in the axils of the branches, solitary. Sea shores. A very smooth, succulent, prostrate plant, with milky juice. Stems 6—10 inches long, dichotomous, procumbent. Leaves oblong and linear-lanceolate, sessile or nearly so, rarely cordate at base. Stipules subulate and simple. Flowers small, in the forks of the stem. June, July. Ann. *Knot-grass Spurge.*

7. E. IPECACUA'NHA.

Procumbent or suberect, small, smooth; *leaves* opposite, obovate and lanceolate; *peduncles* elongated, axillary, 1-flowered. Sandy soil. Root perennial, very long. Stem thick and succulent, 3—8 inches long. Leaves sessile, varying from obovate to linear. Flowers solitary. Peduncles as long as the leaves. June.

ORDER CXXIV. EMPETRACEÆ. *The Crowberry Tribe.*

Fls.—Diœcious. *Cal.* consisting of hypogynous, imbricated scales.
Sta.—Equal in number to the inner sepals and alternate with them.
Ova.—3—9-celled, with a single erect ovule in each cell.
Styles short or 0. *Stigmas* lobed and often lacerated.
Fr.—Drupe seated in the persistent calyx, containing 3—9 bony nucules.

Small, evergreen, heath-like shrubs. Leaves exstipulate. Flowers minute, axillary. They are acrid, but of no known use.

EMPE'TRUM.

Flowers diœcious. Perianth consisting of 2 series of sepaloid scales. *Sterile fl.*—Stamens 3, anthers pendulous on long filaments. *Fertile fl.*—Styles 3—9, very short, erect, or 0; stigmas oblong, radiate-spreading; drupe globose, 1-celled; seeds 3—9.

Gr. ἐν, upon, πέτρος, a stone; from the places of its natural growth.

E. NIGRUM.

Procumbent; *branches* smooth; *leaves* imbricated, linear-oblong, obtuse at each end, nearly smooth, with a revolute margin. A small, prostrate, alpine shrub, found on the granite rocks of the White Mts. of N. H., and the calcareous mountains of Vt. The stem is 1 to 3 or 4 feet long, much branched and closely covered all around with evergreen leaves which are $\frac{1}{2}$—$\frac{3}{4}$ inch long and a line wide. Flowers very small, reddish, crowded, in the axils of the upper leaves. Berries black, not ill-flavored. May, June. *Crowberry.*

ORDER CXXV. JUGLANDACEÆ. *The Walnut Tribe.*

Flowers monœcious. STERILE in aments. *Corolla* 0.
Cal.—Membranaceous, oblique, irregular. *Sta.* indefinite (3—36).
FERTILE in small clusters. *Corolla* 0 or sometimes present and 3—5-petaled.
Cal.—Tube adherent, limb 3—5-parted. [*Stig.* 1—2, much dilated.
Ova.—1-celled (partially 2—4-celled). *Ovule* solitary, erect. *Styles* 0—2, very short.
Fr.—Drupaceous, 1-celled, with 2—4 imperfect partitions; endocarp bony.
Sd.—2—4-lobed, without albumen, oily.

Trees, mostly North American, with alternate, unequally pinnate leaves and no stipules.
Properties. The well known fruit of the *butternut*, *walnut*, *pecan-nut*, *&c.*, is sweet and wholesome, abounding in a rich, drying oil. The epicarp, and even the integument of the kernel are very astringent. The timber is highly valuable.

Genera.

Corolla of the fertile flowers	4-cleft. Leaves 15—21-foliate.	*Juglans.*	1
	none. Leaves 5—9-foliate.	*Carya.*	2

1. JUGLANS.

Sterile fl. in an imbricated, simple ament; calyx scale 5—6-parted. somewhat bracteate at base; stamens about 20. *Fertile fl.*—Calyx 4-cleft, superior; corolla 4-parted; stigmas 2; fruit drupaceous, epicarp spongy, indehiscent, endocarp rugose and irregularly furrowed.

Lat. *Jovis glans*; i. e. the nut of Jove, a name given it by way of eminence.

1. J. CINE'REA. *L.* J. cathartica. *Mx. f.*

Leaflets numerous (15—17), lanceolate, serrate, rounded at the base, soft-pubescent beneath; *petioles* villous; *fruit* oblong-ovate, with a terminal, obtuse point, viscid, hairy; *nucleus* oblong, acuminate, deeply and irregularly furrowed. The butternut is found throughout the N. England, Middle and Western States, and Canada, growing on elevated river-banks and on cold, uneven, rocky soils. It is 40—50 feet high, with a large, but short trunk. The branches are horizontal and unusually wide-spreading, forming a very large head. Leaves 12—20 inches long, consisting of 7 or 8 pairs of leaflets with an odd one. Barren flowers in long aments; fertile in short spikes. The kernel is oily, pleasant-flavored and well known in N. England. The wood is of a reddish hue, light, and is considerably used in panneling and ornamental work. From the bark is extracted an excellent cathartic. April. May. *Butternut.*

2. J. NIGRA.

Leaflets numerous (15—21), ovate-lanceolate, serrate, subcordate, tapering above; *petioles* and under side of the leaves subpubescent; *fruit* globose, with scabrous punctures. The black walnut is a common forest tree in the Middle and Western States, but is scarcely found in the Northern. It arises 60—70

feet high with a diameter of 3—6. In open lands it spreads widely into a spacious head. The duramen of the wood is compact and heavy, of a deep violet color, surrounded with a white albumen. It is used extensively, west of the Alleghanies, for building, and every where for cabinet work. April. May. *Black Walnut.*

2. CA'RYA.

Sterile fl.—Aments imbricated, slender and mostly ternate; scales 3-parted; stamens 4—6; anthers hairy. *Fertile fl.*—Calyx 4-cleft, superior; corolla 0; styles 0; stigma divided, 2-lobed, the lobes bifid; epicarp 4-valved; nucleus subquadrangular, even.

Gr. καρυα, the walnut, from καρα, roundish; in allusion to the shape of the nut. Large trees. Pubescence stellate.

1. C. ALBA. *Nutt.* Juglans squamosa. *Mx. f.*

Leaflets 5—7, on long petioles, oblong-lanceolate, acuminate, sharply serrate, villous beneath, the odd one sessile; *aments* filiform, smooth; *fruit* somewhat quadrangular, smooth. Native throughout the Atlantic States and sometimes farther west. In forests it is very tall and slender, with rough and shaggy bark, consisting externally of long, narrow plates loosely adhering by the middle. Like other hickories, the wood is strong and elastic, compact and heavy, and is much used where these qualities are required, as in making hoops, whip stalks, axe handles, the keels of vessels, &c. It is considered superior to all other wood for fuel. The fruit is covered with a very thick epicarp separating into 4 parts, and containing a thin-shelled, richly-flavored kernel. April. May. *Shag-bark Walnut or Hickory.*

2. C. TOMENTO'SA. *Mx.* Juglans alba. *L.*

Leaflets 7 or 9, oblong-lanceolate, acuminate, slightly serrate, pubescent beneath, odd one subpetiolate; *aments* filiform, tomentose; *fruit* subglobose, smooth, with a very thick pericarp; *nut* with a hard, thick shell and a small, but agreeably-flavored kernel. This tree is found in all the Atlantic States, growing 50 feet high in woods. The bark is thick and rugged, but never scaly. In winter it may be known by its large, greyish white and very hard buds. The drupes, which are very various in size, have a small kernel difficult to extract, on which account they are less sought than the *shag-barks.* April. May. *White Walnut. Mockernut Hickory.*

3. C. PORCI'NA. *Nutt.* Juglans glabra. *Willd.*

Leaflets mostly 7, lanceolate, acuminate, serrate, smooth both sides, odd one subsessile; *fruit* and *nucleus* obcordate or oblong. Found in woods throughout the U. S., growing to the hight of 50—70 feet. The drupes afford small, bitter kernels. The wood possesses the general properties of the hickories in a superior degree and is used wherever great strength is required. It makes excellent fuel. May. *Hog Walnut.*

4. C. AMA'RA. *Nutt.* Juglans amara. *Mx.*

Leaflets about 9, ovate-oblong, acuminate, sharply serrate, smooth both sides, except the pubescent nerves and midrib, odd one short, petiolate, the rest sessile; *fruit* subglobose, with the sutures prominent above; *drupe* smooth, subglobose; *kernel* bitter. Grows in most of the U. S. but attains its greatest size in Penn. and along the Ohio valley. The drupe has a thin shell which may be broken by the fingers and contains a kernel so bitter that animals will scarcely touch it. *Bitternut Hickory.*

ORDER CXXVI. CUPULIFERÆ. *The Oak Tribe.*

Flowers generally monœcious. STERILE in aments, FERTILE solitary, or 2 or 3 together, [or in fascicles.
Cal.—Sepals regular and membranous, or scale-like.
Sta.—1—3 times as many as the sepals, inserted into their bases. [several ovules in each.
Ova.—Adherent, seated within a coriaceous involucrum (cupule), with several cells and
Stig.—Several, subsessile, distinct.
Fr.—A bony or coriaceous nut, more or less enclosed in the cupule.
Eds.—1, 2, or 3 (most of the ovules being abortive,) pendulous. *Albumen* 0.
Embryo large. *Cotyledons* fleshy, plano-convex. *Radicle* minute, superior.

Trees and shrubs. Leaves stipulate, alternate, simple, straight-veined (veins proceeding straight from the midrib to the margin). The Cupuliferæ constitute a large portion of the forests of the northern temperate regions, and of mountainous tracts within the tropics.

Properties. The bark of the oak and other genera is well known for its astringent qualities. The edible fruit of the *hazle-nut*, *chestnut*, *beechnut*, *&c.*, are too well known to require description. *Cork* is the bark of Quercus Suber. *Nut-galls* are produced from the petioles of Q. infectoria of Asia Minor, being caused by wounds made by insects.

Conspectus of the Genera.

Nut enveloped (acorn) partly immersed in a scaly cupule.	in an echinate, valvate cupule, and ovoid-compressed.	*Castanea.*	2
	in a muricate, valvate cupule, and sharply 3-angled.	*Fagus.*	3
	in a hairy, coriaceous involucrate cupule.	*Corylus.*	4
	inflated, membranous, closed cupule.	*Ostrya.*	5
		Quercus.	1
Nut naked, concealed in the axil of a foliaceous bract.		*Carpinus.*	6

1. QUERCUS.

Sterile fl. in a loose ament; calyx mostly 5-cleft; stamens 5—10. *Fertile fl.*—Cupule cup-shaped, scaly; calyx incorporated with the ovary, 6-lobed; ovary 3-celled, 2 of the cells abortive; style 1; stigmas 3; nut (acorn) coriaceous, 1-celled, 1-seeded, surrounded at the base by the enlarged, cup-shaped, scaly-cupule.

Celtic, *quer*, fine, and *cuez*, a tree; so called emphatically, because the sacred missletoe grew upon it. The more common Celtic name was *derw*; hence *druid*. A noble genus of trees, rarely shrubs. Aments axillary, pendulous, filiform, with the flowers distinct.

* Fructification annual. Leaves not mucronate, † lobed.

1. Q. ALBA.

Leaves oblong, pinnatifid-sinuate, smooth; *lobes* linear-oblong, obtuse, entire, dilated upwards; *fruit* pedunculate, cup deep, warty, acorn ovate. The white oak grows in woods throughout the U. S. and Canada, and for grandeur, strength and usefulness, stands preeminent among the sons of the forest. With a diameter of 5—6 feet it attains the hight of 70—80, but its magnitude varies with the soil and climate. Leaves obliquely divided into rounded, obtuse and entire lobes, not terminated by mucronate points, pubescent beneath when young. Fruit rather large. Bark white, often with dark spots. The trunk yields timber of great value for strength and durability. It is extensively employed in ship-building, in coopering, in carriage making, in ploughs, mills, &c. The bark is useful in tanning, and in medicine. May. *White Oak.*

2. Q. OBTUSILO'BA. *Mx.* Q. stellata. *L.*

Leaves oblong, sinuate, cuneiform at the base, pubescent beneath; *lobes* obtuse, the upper one dilated, 2-lobed; *calyx* hemispherical; *acorn* oval. The iron oak, called also *post oak*, *box white oak*, *turkey oak*, *&c.*, is common in the Middle and Southern States, rare in N. England. It is a tree of moderate size, with widely spreading and very crooked branches. The bark is

greyish white. Leaves in 4 or 5 lobes which are sometimes so arranged as to appear cruciform or stellate. Acorns very sweet. The timber is finer grained, stronger and more durable than white oak, hence it is useful for posts, staves, carriages, &c. The crooked branches afford *knees* for ship-building. *Iron Oak.*

3. Q. MACROCA'RPA.

Leaves tomentose beneath, deeply and lyrately sinuate-lobed, lobes obtuse, repand, upper ones dilated; *cupule* deep, with the upper scales setose; *acorn* ovate, turgid. Most common in the Western States, frequenting limestone hills, but is occasionally met with in Vt. and N. Y. It is 60—70 feet in hight, clothing itself with dark green, luxuriant foliage. Leaves 10—15 inches long; being larger than those of any other species here described. The acorns are also of extraordinary size, enclosed $\frac{2}{3}$ of their length in the cup which is usually bordered with hair-like filaments. May. *Over-cup White Oak.*

4. Q. OLIVÆFO'RMIS.

Leaves oblong, smooth, glaucous beneath, deeply and unequally sinuate-pinnatifid; *cup* deeply bowl-shaped, fringed on the edge; *acorn* oval-ovate. This species of oak is confined to a few districts of N. Y. and Penn. It is a large and majestic tree, chiefly remarkable for its smaller branches always inclining downwards. The leaves are so irregularly cut and lobed that scarcely two can be found alike. May. *Mossy-cup Oak.*

* Fructification annual. Leaves not mucronate, †† dentate, not lobed.

5. Q. PRINUS. *Willd.* Q. Prinus palustris. *Mx.*

Leaves on long petioles, obovate, acute, pubescent beneath, with coarse, unequal, dilated teeth, callous at the tip; *cup* deep, attenuate at base; *acorn* ovate. This oak is seldom met with in N. England, but abounds in the rest of the U. S. It is one of the loftiest trees of the forest, arising to the hight of 50 feet with its undivided, straight and uniform trunk, and thence with its expansive top to the hight of 80—90 feet. Flowers appear in May, succeeded by large and sweet acorns. The timber is valuable in the arts, and makes excellent fuel. *Swamp Chestnut Oak.*

6. Q. BI'COLOR. *Wil'd.* Q. Prinus discolor. *Mx.*

Leaves oblong-ovate, downy, white underneath, coarsely toothed, entire at the base, the teeth unequal, dilated, rather acute, callous at the tip; *petioles* short; *fruit* on long peduncles, in pairs, cup hemispherical, acorn oblong-ovate. The swamp oak is diffused throughout most of the U. S., growing in low, swampy woods. It is a beautiful tree, attaining in favorable situations the hight of 70 feet. Foliage rich and luxuriant, smooth and green above and white downy beneath, from which singular contrast is derived the specific name. The trunk is covered with a greyish white bark which divides into large flat scales. It affords excellent fuel and timber. *Swamp White Oak.*

7. C. MONTA'NA. *Willd.* Q. prinus monticola *Mx.*

Leaves broad ovate, oblong, white downy beneath, shining above, coarsely toothed, obtuse and unequal at the base; *teeth* very obtuse, subequal; *fruit* in pairs, on short peduncles, cup hemispherical, with rugose and tubercular scales, acorn ovate. This oak, sometimes called rock chestnut oak, is native of the Northern and Middle States, growing in woods and mountain sides. Its hight seldom exceeds 60 feet, and is generally much less. In open situations its top spreads widely, and symmetrically. The petiole is yellow, rather short. Timber valuable in ship-building, &c. *Mountain Oak.*

8. Q. CASTA'NEA. *Willd.* Q. Prinus acuminata. *Mx.*

Leaves on long petioles, oblong-lanceolate, obtuse at base, acuminate, downy beneath, with coarse, subequal, dilated, obtuse teeth; *cup* hemispherical; *acorn*

roundish ovate. The yellow oak abounds in the Middle and Western States, in rocky and mountainous woods. It is a large tree, 60 feet in hight. Bark whitish, slightly furrowed. Leaves regularly toothed, light green above, whitish beneath. Flowers in May, succeeded by acorns usually sweet-flavored. Timber little used. *Yellow Oak. Chestnut Oak.*

9. Q. CHI'NQUAPIN. *Mx.* Q. prinoides. *Willd.*

Leaves on short petioles, obovate, acute at the base, glaucous beneath, with coarse, subequal, dilated teeth, callous at the tip; *cup* hemispherical; *acorn* ovate. This is one of the most diminutive of all the oaks, never exceeding 3—4 feet in hight. It is native of the Northern and Middle States, in barren woods, but not common. The flowers appear in May, followed by acorns of middle size, very sweet and so abundant as often to weigh the shrub prostrate on the ground. *Dwarf Chestnut Oak.*

* * Fructification biennial. Leaves setaceously mucronate, sinuate-lobed.

10. Q. RUBRA.

Leaves on long petioles, smooth, obtusely sinuate, lobes rather acute, dentate; *cup* shallow and flat, smoothish; *acorn* subovate. The red oak is the most common species in the Northern States and in Canada. It is a lofty, wide-spreading tree, 70 feet in hight with a diameter of 3 or 4. The leaves are 6—10 inches long, smooth on both sides, with deep and rounded sinuses between the narrow, mucronate lobes. The flowers appear in May, succeeded by very large acorns contained in cups so shallow as rather to resemble saucers than cups, and are greedily devoured by wild and domesticated animals. The bark is extensively used in tanning. The wood is reddish, coarse-grained, of little value as timber, but excellent for fuel. *Red Oak.*

11. R. TINCTO'RIA.

Leaves obovate, oblong, a little sinuate, pubescent beneath, lobes oblong, obtuse, mucronate; *cup* flat; *acorn* depressed-globose. This oak is found throughout the U. S. It is one of the loftiest trees of the forest, 80—90 feet in hight and 4—5 in diameter. Bark deeply furrowed, black or deep brown. Leaves 6—8 inches long, broadest towards the end. Acorns brown, nearly sessile, about half covered with the thick, scaly cup. From the bark of this species, *quercitron*, used in dyeing, is obtained, hence it is called quercitron oak. The bark is used in tanning. *Black Oak.*

12. Q. COCCI'NEA.

Leaves on long petioles, oblong, deeply sinuate, smooth, lobes divaricate, dentate, acute; *cup* turbinate, scaly; *acorn* short, ovate. The scarlet oak is most abundant in the Middle and Southern States, but is often met with in the more southern parts of N. England. It is a large tree, 80 feet in hight, with a diameter of 3 or 4. Leaves of a bright, shining green, with about 4 deep sinuses remarkably rounded and broad at the base. By the frosts of autumn they are changed to *scarlet*, unlike those of the red oak which become dull red or brown. Acorns large, similarly rounded at both ends, half immersed in the cup. Bark very thick, used in tanning. The wood is little valued for timber or fuel. *Scarlet Oak.*

13. Q. PALU'STRIS.

Leaves on long petioles, oblong, deeply sinuate, smooth; *axils of the veins* villous beneath, lobes divaricate, dentate, acute; *cup* flat, smooth; *acorn* subglobose. The pin oak is most luxuriant in Penn. and the adjacent districts of other States, rare in New England, growing in swamps and wet woods. Hight 60—80 feet, with a diameter of 2—4. It is remarkable for its unusual number of secondary branches which die as the tree advances, giving the trunk the appearance of having *pins* or tree nails driven into it. Bark smooth. Wood coarse-grained, little esteemed as timber. Acorns small, round, in shallow cups. May. *Pin Oak.*

14. Q. ILICIFO'LIA. *Willd.* Q. Bannisteri. *Mx.*

Leaves on long petioles, obovate-cuneate, 3—5-lobed, entire on the margin, whitish-downy beneath; *cup* subturbinate; *acorn* subglobose. A shrub, common throughout the U. S., growing only on gravely hills and barrens which it occupies exclusively in large tracts. Stem 3—4 feet high, divided into numerous, straggling branches. Acorns small and abundant, and said to be greedily eaten by bears, deer, and swine. May. *Shrub or Scrub Oak. Bear Oak.*

2. CASTA'NEA.

Sterile fl. in a long, cylindric ament; calyx 6-cleft; stamens 10—12. *Fertile fl.* 3, within a 4-lobed, densely muricated involucre; calyx 5—6-lobed; stamens 10—12 abortive rudiments; styles 6; nut mostly 1-seeded, invested with the enlarged, echinate involucre or cupule.

From *Castanea,* a town in Thessaly, where this tree still grows to magnificent dimensions. Trees and shrubs.

C. VESCA. *β. Americana. Mx.* Fagus Castanea. *L.*

Leaves oblong-lanceolate, acuminate, mucronately serrate, smooth both sides. Abundant in particular districts throughout the U. S. It is a lofty tree, with a large, straight trunk. Leaves quite large (6—9 inches long and $\frac{1}{4}$ as wide), with large, uniform teeth, mucronate with the prolonged, straight veins. Aments as long as the leaves and so numerous as to impart their yellowish hue to the whole tree when in blossom. The nuts are about 3 together, of a peculiar brown, villous above, enclosed in the enlarged cupule or burr which is beset on all sides with strong, compound, acute spines. Timber coarse-grained, strong, elastic, light and very durable, hence much used for posts, &c. July. The nuts are smaller, but sweeter than those of the European variety (the *Spanish chestnut*). *Chestnut.*

3. FAGUS.

Sterile fl. in a globose ament; calyx 6-cleft, campanulate; stamens 5—12. *Fertile fl.* 2, within a 4-lobed, prickly involucre; calyx single, with 4—5 minute lobes; styles 3; nut 1-seeded, enclosed within the enlarged, spiny involucre or cupule.

Gr. φηγος, the beech; it also signifies something eatable. Trees.

1. F. FERRUGI'NEA. *Ait.*

Leaves ovate-oblong, acuminate, pubescent beneath, coarsely dentate, obtuse at base and oblique-subcordate; *nut* ovate, acutely triangular and very acute at apex. A common forest tree, most abundant in N. England and the British Provinces. Trunk tall and straight in forests, but like other trees, with a more expansive top in open situations. Bark light gray and smooth. Branches irregular and crooked. Leaves with very regular, straight veins, often persistent through the winter in their withered state. Nuts small, 2 together, invested with the burr-like cupule, oily, sweet and nutritious. Timber of a dark reddish color, fine-grained, much used in turnery, mill-gearing and in making joiners tools. Also extensively used for fuel. May. *Red Beech.*

2. F. SYLVA'TICA. *L.* S. sylvestris. *Mx.*

Leaves ovate, acuminate, slightly dentate, ciliate at the margin, acute at the base; *nuts* ovate-triangular, obtuse-mucronate. Native of the forests of

N. England, and of many districts in the Middle States. It is a tree of large dimensions, often arising to the hight of 70 or 80 feet. It is distinguishable from the red beech by the size, the lighter color of the bark and wood. The wood is also of more difficult cleavage, of greater compactness and strength, and preferable, both as timber and fuel. May. *White Beech.*

4. CO'RYLUS.

Sterile fl. in a cylindric ament; calyx scale 3-cleft; stamens 8; anthers 1-celled. *Fertile fl.*—Calyx obsolete; ovaries several; stigmas 2; nut ovoid, surrounded with the enlarged, coriaceous, lacerated involucre (cupule).

Gr. κορυς, a bonnet; to which the cupule enwrapping the nut may well be compared. The English name *hazel* comes from the Saxon *haesel*, a head-dress. Shrubs. Aments and capitate fertile clusters subterminal.

1. C. AMERICA'NA.

Leaves roundish, cordate, acuminate; *involucre* roundish-campanulate, much larger than the roundish nut, its border dilated and coarsely serrate. Shrub 5—6 feet high, growing in thickets and borders of fields. Leaves 3—6 inches long and $\frac{2}{3}$ as wide. From the ends of the branches hang the long, pendulous aments of barren flowers in April. The nuts are remarkably distinguished by the large, bell-shaped involucre in which each one is enveloped. They are a well-flavored fruit, though somewhat inferior to the European hazel or *filbert.* *Hazel.*

2. C. ROSTRA'TA. *Ait.*

Leaves oblong-ovate, acuminate; *stipules* linear-lanceolate; *involucre* campanulate-tubular, longer than the nut, 2-parted, with dentate segments. This species is found in the same localities as the former, is a rather smaller shrub, and chiefly differs from it in the involucre, which is covered with short, stiff hairs, and contracted at the top into a long (1—1½ inch) narrow neck like a bottle. Nuts as in C. Americana. May. *Beaked Hazel.*

5. O'STRYA.

Sterile fl. in a cylindric ament; calyx scale roundish-ovate, ciliate, 1-flowered; anthers conspicuously bearded at the summit. *Fertile fl.* geminate, in a loose, linear ament; calyx 0; flowers enclosed each in an inflated membranous sac, which, at length, enlarged, contains the matured nut.

Gr. οστρεον, a scale; in allusion to the conspicuous sacs (not *scales*) of the fertile aments. Small trees.

O. VIRGI'NICA.

Leaves ovate, acuminate, serrate; *fertile ament* oblong, pendulous; *buds* rather acute. A small tree disseminated throughout the U. S., 25—30 feet in hight. Its bark is remarkable for its fine, narrow, longitudinal divisions. Leaves about twice as long as wide. The fruit is similar in appearance to hops, suspended from the ends of the branches, consisting of membranous, imbricated sacs, (cups?) containing each a flower. The wood is very white, hard and strong, much used for levers, &c. Apr. May.

Hop Hornbeam. Iron-wood. Lever-wood.

6. CARPI'NUS.

Sterile fl. in a long, cylindric ament; calyx scale roundish, ciliate; stamens 8—14, slightly bearded at summit. *Fertile fl.* in a loose ament; scale large, oblong, 3-lobed, 1—3-flowered; calyx 6-toothed; stigmas 2; nut long, ovoid, furrowed, 1-seeded.

Celtic, *car*, wood, and *pin*, the head; that is to say, wood fit for making yokes for cattle, to which use the hornbeam is peculiarly adapted. Small trees. Scales of the fertile aments persistent and becoming foliaceous.

C. AMERICA'NA.

Leaves oblong-ovate, acuminate, unequally serrate; *scales of the fertile ament* 3-parted, the middle segment much the largest, oblique, with a lateral tooth. A small tree (12—20 feet high), common in woods throughout the U. S. The wood is very fine-grained, compact and white, covered with a light gray or ash-colored bark. Leaves 2—4 inches long, ½ as wide, petiolate. From the ends of the branches hang the long, loose, pale green, leafy aments, consisting of alternate pairs of enlarged scales, with a dark-colored nut at the base of each. April, May. *Hornbeam.*

ORDER CXXVII. BETULACEÆ. *The Birch Tribe.*

Fls.—Monœcious, amentaceous and mostly achlamydeous, ternate in the axil of a 3-lobed bract.
STERILE.—*Sta.* definite, distinct. *Anth.* 2-celled.
FERTILE.—*Ova.* 2-celled, 2-ovuled. *Styles* or *stigmas* 2, distinct.
Fr.—1-celled and 1-seeded (by abortion), membranous and indehiscent.
Seed pendulous, without albumen.

A small order of shrubs and trees. Leaves alternate, simple, with the primary veins running straight from the midrib to the margin. Stipules deciduous. Chiefly natives of the cool parts of the northern hemisphere. Properties generally astringent. The birches are often fine timber trees.

Genera.

Stamens	10—12. Scales of the fertile aments 3-flowered.	*Betula.*	1
	4. Scales of the fertile aments 2-flowered.	*Alnus.*	2

1. BE'TULA.

Sterile fl. in a cylindric ament; bracts deeply 3-parted, peltate; calyx 0; stamens 10—12. *Fertile fl.*—Ament oblong-ovoid; scales subtrilobate; calyx 0; nut compressed, with a membranaceous margin.

Betu is the Celtic name for the *birch*. Trees and shrubs.

* Trees.

1. B. PAPYRA'CEA.

Leaves ovate, acuminate, doubly serrate, the veins hairy beneath; *fertile aments* nodding, pedunculate; *lateral lobes of the calyx* short, roundish. This birch is abundant in the hillside woods of N. England, &c. It sometimes attains the hight of 60—70 feet, but is generally smaller. The trunk, which is 1—2 feet in diameter is covered with a tough cuticle consisting of numerous laminæ, the outer of which is snow white. Of this the Indians construct their light canoes. The bark upon the branches is dark brown. Leaves 2—3 inches long, ½ as wide. Sterile aments 1—2 inches long. The wood is of a fine, compact texture, but not durable, and is used in turnery and furniture work. May, June. *Paper Birch. Canoe Birch.*

2. B. POPULIFO'LIA.

Leaves deltoid, long-acuminate, unequally serrate, very smooth, on smooth petioles; *fertile aments* pedunculate; *scales* with roundish, lateral lobes. This species, like the preceding, is distinguished for the white cuticle with which the trunk is invested. It is common in the rocky and mountainous woods of N. England, where it seldom exceeds 30—40 feet in hight. The branches are covered with a reddish brown bark, very slender, and throw out, in May, long, pendulous aments. *Common White Birch.*

3. B. EXCE'LSA.

Leaves ovate, acute, serrate, on pubescent petioles, shorter than the peduncles; *barren aments* ovate, erect; *scales* with rounded lateral lobes. A common forest tree in N. England, arising in woods to the hight of 60—80 feet, with a trunk 2—3 feet in diameter, invested with a thin, yellowish cuticle. Barren aments 2—4 inches long, cylindric, clustered, and pendulous at the ends of the branches. The wood is chiefly valuable as fuel. *Yellow Birch.*

4. B. LENTA.

Leaves cordate-ovate, acuminate, acutely serrate, nerves beneath and petioles hairy; *fertile aments* erect. This noble species is common in the Eastern and Middle States, often exceeding 60 feet in hight, with a diameter of 2—3 feet. The trunk is invested with a dark brown or reddish bark, which becomes rough in old trees, and is remarkable for its agreeably aromatic fragrance and flavor. Leaves 3—4 inches long, about $\frac{1}{2}$ as wide. Sterile aments 2—3 inches long; fertile, much shorter and thicker. In spring the cambium affords the boys a delicious morsel. The wood is of a reddish color, strong, compact, and takes a good polish. It is much used in cabinet-work. April. May. *Black Birch. Mahogany Birch.*

* * Shrubs.

5. B. GLANDULO'SA.

Low; *branches* glandular-punctate, smooth or pubescent; *leaves* obovate, serrate, very entire at base, smooth, subsessile; *fertile ament* oblong; *scales* half 3-cleft; *lobes* ovate-oblong, middle one rather longest; *nut* orbicular, with a narrow margin. A shrub, inhabiting the mountainous districts of the Northern States. Hight 3—5 feet. Leaves scarcely an inch in length, varying in width. *Scrub Birch.*

β. pumila; *branches* pubescent; *leaves* orbicular-ovate, petiolate, densely pubescent beneath; *fertile aments* cylindric.

6. B. NANA.

Low, smooth; *leaves* orbicular, crenate, reticulated beneath; *scales of the ament* deeply 3-parted; *seeds* orbicular, nearly wingless. This miniature tree is found on the summits of Mt. Clinton, Mt. Franklin, &c, of the White Mts. It is scarcely more than a foot in hight, often but a few inches, the branches few and straggling, the leaves $\frac{1}{3}$—$\frac{2}{3}$ inch in diameter, smooth both sides, pale and distinctly reticulate beneath, and on petioles 1—2 lines long. May, June. *Dwarf Birch.*

2. ALNUS.

Sterile fl.—Ament long, cylindric, composed of cuneate, truncate, 3-lobed, 3-flowered bracts; calyx 4-parted; stamens 4. *Fertile fl.*—Ament ovoid; bracts 2-flowered; 3-fid; calyx 0; nut wingless, compressed.

The old Latin name for these shrubs.

1. A. SERRULA'TA. *Willd.* Betula serrulata. *Ait.*

Leaves obovate, acuminate, doubly serrulate, the veins and their axils hairy beneath; *stipules* elliptical, obtuse. A well known shrub growing in clumps, and forming thickets on the borders of ponds and rivers, and in swamps. Stems numerous, rather straight, 10—15 feet in hight. Leaves 2—4 inches long and $\frac{2}{3}$ as wide, strongly nerved; petioles $\frac{1}{3}$—$\frac{1}{2}$ inch long. Aments 2—3 inches long, slender, pendulous, fascicled at the ends of the branches; fertile ones short, thick, dark brown, persistent, several together a little below the sterile ones. March, April. *Common Alder.*

2. A. CRISPA. *P.* A. undulata. *Willd.*

Leaves ovate, acute, somewhat undulate, unequally serrate; *petioles* and *veins* beneath hairy, axils smooth; *stipules* ovate-oblong. Mountains. A shrub, 3—4 feet high. April. *Crisp-leaved Alder.*

ORDER CXXVIII. MYRICACEÆ. *The Gale Tribe.*

Fls.—Monœcious or diœcious, amentaceous, each axillary to a bract.
STERILE.—*Sta.* 2—6. *Anth.* 2—4-celled, opening longitudinally.
FERTILE.—*Ova.* 1-celled, 1-ovuled, surrounded by several hypogynous scales.
Stig.—2, subulate, or dilated and petaloid.
Fr.—Drupaceous or dry. *Seed* solitary, erect, without albumen.

Aromatic shrubs with resinous glands and dots. Leaves alternate, simple.

Genera.

Leaves	cuneate-lanceolate, serrate. Flowers diœcious.	*Myrica.*	1
	sinuate-pinnatifid. Flowers monœcious.	*Comptonia.*	2

1. MYRI'CA.

Flowers diœcious. Aments ovate-oblong; scales loosely imbricate, lunate. *Sterile fl.*—Stamens 4—6, short, erect; anthers large, 4-valved. *Fertile fl.*—Ovary 1, superior; styles 2, spreading; stigmas 2, acute; drupe 1-celled, 1-seeded.

Gr. μυρω, to flow; because some of the species are native of river banks and inundated places.

1. M. GALE.

Leaves cuneate-lanceolate, serrate and obtuse above; *sterile aments* imbricate, with acuminate, ciliate scales; *fruit* in a scaly head. A branching shrub, 4—5 feet in hight; about the borders of ponds and mountain-lakes. Leaves smooth, alternate. Aments short. Fruit with a strong, pungent, spicy fragrance. May. *Sweet Gale. Dutch Myrtle.*

2. M. CERI'FERA.

Leaves cuneate-lanceolate, acute and with a few serratures at the top; *sterile aments* lax; *scales* acute; *fruit* spherical, naked, distinct. This interesting and useful shrub is found in dry woods and fields. It varies much in size from 2 feet to 8. It is covered with a greyish bark, and has a very branching top with numerous dry-looking, scattered leaves, varying from wedge-lanceolate to linear-lanceolate, on short petioles. The fertile plants produce small aments of flowers, succeeded by dense, irregular clusters of a small, round, dry, berry-like fruit. This fruit consists of a globular stone enclosing a kernel, and covered with a coating of whitish wax, which, being separated by boiling water, constitutes the *bayberry tallow* of commerce. May. *Bayberry. Wax Myrtle.*

2. COMPTO'NIA.

Flowers monœcious. *Sterile fl.*—Ament cylindric; bract reniform-cordate, acuminate; calyx scale 2-parted; stamens 3, forked; anthers 6. *Fertile fl.*—Ament ovate; calyx scales 6, longer than the bract; styles 2; nut ovoid, 1-celled.

Named in honor of Henry Compton, Lord Bishop of London, who made extensive collections of plants.

C. ASPLENIFO'LIA. *Ait.* Liquidambar aspl. *L.*

Leaves long, linear-lanceolate, alternately sinuate-pinnatifid. A well known, handsome, aromatic shrub, 2 feet high, common in dry woods and hills. The main stem is covered with a rusty, brown bark, which becomes reddish in the branches, and white downy in the young shoots. Leaves numerous, on short peduncles, 3—4 inches long, ½ inch broad, divided nearly to the midrib into numerous, rounded lobes so as to resemble those of the spleenwort. Stipules in pairs, acuminate. Barren flowers in erect, cylindric catkins, terminal and lateral. Fertile flowers in a dense, rounded burr or head, situated below the barren ones. Fruit a small, ovate, brown, 1-celled nut. May. *Sweet Fern.*

ORDER CXXIX. SALICACEÆ. *The Willow Tribe.*

Fls.—Diœcious, amentaceous, achlamydeous, axillary to 1-flowered bracts.
STERILE.—*Sta.* 2—several, distinct or monadelphous. *Anth.* 2-celled.
FERTILE.—*Ova.* 1—2-celled. *Ovules* numerous, erect. *Styles* or *stigmas* 2.
Fr.—Coriaceous, 1-celled, 2-valved.
Sds.—Numerous, ascending, furnished with a silky coma. *Albumen* 0.

Trees and shrubs. Leaves alternate, simple. Stipules deciduous or persistent. Chiefly natives of the northern temperate and frigid zones, one species, Salix arctica, extending farther north than any other known woody plant.

Properties. The bark is astringent and tonic, possessing the febrifugal properties of the sulphate of quinia. The wood is employed for various economical purposes.

Genera.

Stamens	2—5. Capsule 1-celled.	*Salix.*	1
	8—20. Capsule 2-celled.	*Populus.*	2

1. SALIX.

Aments cylindric; bracts imbricate. *Sterile fl.* with a nectariferous gland at the base of the bract; stamens 2—5. *Fertile fl.*—Stigmas 2, mostly bifid; capsule 1-celled.

Celtic, *sal*, near, and *lis*, water; alluding to their usual locality. Trees and shrubs.

* Leaves entire or subserrate. Aments precocious (S. Uva-Ursi excepted).

1. S. VIMINA'LIS.

Leaves linear-lanceolate, very long, acuminate, subentire, silky-canescent beneath; *stipules* minute; *branches* virgate; *aments* precocious (appearing before the leaves); *scales* roundish, very hairy; *ovaries* sessile, ovoid; *style* filiform; *stigmas* undivided, acute. This beautiful willow was probably introduced from Europe. Wet meadows and margins of rivers. Stems 10—12 feet high, with long, straight, slender and flexible branches. Leaves often a foot in length, narrow, covered with a snow white pubescence beneath. Aments very hairy. May. *Osier. Basket Willow.*

2. S. CA'NDIDA. *Willd.*

Leaves lanceolate or linear-lanceolate, very long, obscurely serrulate at the summit, pubescent above, hoary-tomentose beneath, revolute on the margin; *stipules* lanceolate, as long as the petioles; *aments* cylindric; *scales* obovate, obtuse, very long, hairy; *stigmas* 2-lobed. A beautiful species in shady woods. Stems 4—6 feet high. Leaves 8—12 inches long, 1—2 wide. Catkins dense, white with dense wool. Styles and stigmas dark red, ½ inch in length. April. May. *White Willow.*

3. S. MUHLEBERGIA'NA. *Willd.* S. alpina. *Walt.*

Leaves lanceolate, subacute, entire, hoary-pubescent, rugosely veined beneath, revolute on the margin; *stipules* lanceolate, deciduous; *aments* diandrous; *scales* oblong, villous on the margin; *ovaries* ovoid-lanceolate, silky-villose, raised on long pedicels; *style* short; *stigmas* bifid. A shrub, 3—5 feet high, erect or procumbent, in dry woods. Branches greenish-yellow, punctate with black dots. Scales of the aments white, tipped with red. Anthers purple and yellow. April. *Muhlenberg's Willow.*

4. S. PEDICELLA'RIS.

Branches smooth; *leaves* obovate-lanceolate, acute, very entire, smooth and of the same color both sides; *stipules* 0; *aments* pedunculate, very smooth; *scales* oblong, obtuse, scarcely hairy; *ovaries* oblong-ovoid, on pedicels twice as long as the scales; *stigmas* sessile, bifid. A shrub native of mountains, Vt. and N. Y. April.

5. S. ROSTRA'TA. *Rich.*

Branches erect, straight, pubescent, at length smooth; *leaves* broadly or obovate-lanceolate, acute, subentire, at length coriaceous, smooth above, glaucous pubescent beneath; *stipules* semicordate, dentate; *aments* short, cylindric, dense, the fertile ones becoming very long and loose; *scales* oblong, membranous, hairy at the apex; *ovaries* narrow-lanceolate, silky, long-acuminate, on very long pedicels; *styles* very short; *stigmas* lobed, the lobes bifid or entire. Shrub or small tree 8—10 feet high. Bark of the trunk dark-colored, of the branches yellow. Margins of streams, Vt.

6. S. UVA-URSI.

Stem prostrate; *leaves* obovate-spathulate, obtuse, entire, sprinkled with glandular dots near the margin beneath, smooth and shining above; *aments* loose, cotemporary with the leaves; *scales* oblong, ciliate; *ovaries* ovoid, smooth, pedicellate; *style* bifid; *stigmas* 2-lobed. May.

* * Leaves remotely and obtusely serrate.

7. S. CONI'FERA. *Waugh.* S. longirostris. *Mx.*

Leaves oblong-lanceolate, acute, smooth above, tomentose beneath; *stipules* lunate, subdentate; *aments* precocious, diandrous; *scales* lanceolate, obtuse, villous; *ovaries* pedicellate, lanceolate, silky; *styles* long, bifid; *stigma* 2-lobed. A shrub in dry soils, 4—8 feet high, with brown twigs. On the ends of these, cone-like excrescences are often produced by the punctures of insects. Aments covered with very hairy scales, appearing before the leaves in April. *Cone-gall Willow.*

8. S. DI'SCOLOR.

Leaves oblong, rather obtuse, smooth, entire at the end, glaucous beneath; *stipules* lanceolate, serrate, deciduous; *aments* cotemporary with the leaves, oblong, downy, diandrous; *scales* oblong, acute, black, hairy; *ovaries* sessile, downy; *stigmas* 2-parted. A shrub, in swampy grounds, 8—10 feet high, with tough, brown twigs, sometimes used in basket making. April. *Bog Willow. American Basket Willow.*

* * * Leaves closely and acutely serrate, cotemporary (S. grisea excepted), with the aments.

9. S. BABYLO'NICA.

Branches pendulous; leaves lanceolate, acuminate, smooth, glaucous beneath; *stipules* roundish, oblique, acuminate; *ovaries* sessile, ovate, smooth. This elegant species has been introduced from the East, and cultivated until nearly naturalized. The long, slender, drooping branchlets very naturally indicate the English name of the tree, and give it a place in the church-yard to "weep" over the remains of the departed. The Latin name was happily suggested to Linnæus by the 137th Psalm:

By the rivers of *Babylon* there we sat down:
Yea, we wept, when we remembered Zion.
We hanged our harps upon the *willows* in the midst thereof.

Weeping Willow.

10. S. NIGRA. *Marshall.*

Leaves lanceolate, acute at each end, serrulate, smooth and green on both sides; *petiole* and *midrib* above tomentose; *stipules* dentate: *aments* erect, cylindric, villous; *scales* oblong, very villous; *filaments* 3—6 (generally 5), bearded at base; *ovaries* pedicellate, ovoid, smooth; *style* very short; *stigmas* bifid. A small tree, on the banks of rivers, chiefly in N. Y. and Penn. Branches very brittle at base, pale yellow. The trunk has a blackish bark. Sterile aments 3 inches long. May. *Black Willow.*

11. S. LU'CIDA.

Leaves ovate-lanceolate, long-pointed, rounded at base, smooth and shining; *stipules* oblong, serrate; *aments* triandrous; *scales* lanceolate, obtuse, serrate and smooth at the tip, hairy at the base; *ovaries* lanceolate-subulate, smooth; *style* bifid; *stigmas* obtuse. A small tree in low, swampy woods, very smooth and handsome, with yellowish brown branches. Aments short, appearing with the leaves in May. *Shining Willow.*

12. S. CORDA'TA.

Leaves oblong-lanceolate, acuminate, cordate at base, smooth; *stipules* large, roundish-ovate, serrate; *aments* triandrous; *scales* lanceolate, woolly, black; *ovaries* pedicellate, lanceolate, smooth; *styles* very short; *stigmas* bifid. An elegant shrub, 6—8 feet high, in swamps throughout the Middle States. Branches green and smooth, with light green leaves an inch wide and 3 inches long. Aments an inch long, accompanying the leaves in April and May. *Heart-leaved Willow.*

13. S. RI'GIDA.

Leaves oblong-lanceolate, acuminate, subcordate, rigid, smooth, coarsely serrate, the lowest serratures elongated; *petioles* villous; *stipules* large, cordate, obtuse, glandular serrate; *aments* triandrous; *scales* lanceolate, woolly, black; *ovaries* on long pedicels, lanceolate, smooth; *style* very short; *stigmas* 2-parted. A small tree, 10—15 feet high, growing in swamps. Branches green, red towards the end, the younger ones pubescent. Much used in basket-making. April. May. *Stiff-leaved Willow.*

14. S. VITELLI'NA.

Leaves lanceolate, acuminate, with thickened serratures, smooth above, paler and somewhat silky beneath; *stipules* 0; *aments* cylindric; *scales* ovate-lanceolate, pubescent outside; *ovaries* sessile, ovate-lanceolate, smooth; *stigmas* subsessile, 2-lobed. This willow was probably introduced, but is now very common by roadsides, &c. It is a tree of moderate hight, with shining yellow branches. May. *Yellow Willow.*

15. S. GRI'SEA.

Leaves lanceolate, serrulate, acuminate, smooth above, silky beneath; *stipules* ovate-oblong, denticulate, deflected, deciduous; *scales* oblong, hairy, black at the tip; *ovaries* oblong, pedicellate, silky; *stigmas* sessile, obtuse. A shrub 6—8 feet high, in inundated meadows. Branches purple, brittle at base. Leaves 2—4 inches long, $\frac{1}{4}$ as wide. April. *Gray Willow.*

2. PO'PULUS.

Ament cylindric; bracts lasciniate-fringed; scales turbinate, entire, oblique. *Sterile fl.*—Stamens 8—20, seated on the scale. *Fertile fl.*—Stigmas 4-cleft; capsule superior, 2-celled.

Lat. *populus*, the people. In ancient times the public walks at Rome were decorated with rows of *P. dilatata*; whence it was called *arbor populi* Some suppose, however, it is so called on account of its leaves, which are in perpetual agitation like the populace.

1. P. TREMULOI'DES.

Leaves orbicular-cordate, abruptly acuminate, dentate-serrate, pubescent at the margin. Abundant in N. England and in the Middle States, growing in woods and open lands. Stem 25—40 feet in hight, with a diameter of 8—12 inches. Bark greenish, smooth except on the trunk of the oldest trees. Leaves small (2—$2\frac{1}{2}$ inches long, and $1\frac{1}{4}$ as wide), dark green, on petioles which are 2—3 inches long and laterally compressed, so that they can scarcely remain at rest in any position, and are thrown into excessive agitation by the slightest breeze. The trembling of the "aspen leaf" is proverbial. Aments plumed with silken hairs, about 2 inches long, pendulous, appearing in April, long before the leaves. The wood is white, soft and light, of little value. *American Aspen. White Poplar.*

2. P. GRANDIDENTA'TA.

Leaves roundish-ovate, acute, with large, unequal, sinuate teeth, smooth, villous when young. Woods and groves in the northern parts of the U. S., less common than the preceding species. Stem 40 feet high, with a diameter of 1 foot, straight, covered with a smooth, greenish bark. Branches distant, coarse and crooked, clothed with leaves only at their extremities. Leaves 3—5 inches long and nearly as wide, clothed with thick, white down in spring, but becoming perfectly smooth. The wood is white, soft, and quite durable. May. *Large American Aspen or Poplar.*

3. P. BETULIFO'LIA. *P.* P. Hudsonica. *Mx.*

Leaves rhomboidal, long-acuminate, dentate, smooth; *young branches* pilose. This poplar is found chiefly in the vallies of the Hudson and Connecticut. It is a tree of middle size, with grayish white twigs and dark brown buds. Leaves $3\frac{1}{2}$ inches long and 2 broad. Aments 4—5 inches long, without hairs. April. *Birch-leaf Poplar.*

4. P. BALSAMI'FERA.

Leaves ovate-acuminate, with close-pressed serratures, white and reticulate-veined beneath; *buds* resinous. The balsam poplar, though nowhere abundant, is found in woods and fields, disseminated throughout N. England and Canada. With a trunk 18 inches in diameter it arises 60—70 feet. The buds of this species, as well as of most of the poplars, are covered with an aromatic resin, which may be separated in boiling water. Apr. *Balsam Poplar.*

5. P. MONILI'FERA. *Ait.*

Leaves subcordate-deltoid, smooth, glandular at base, with cartilaginous, hairy, hooked serratures; *nerves* spreading; *petioles* compressed above; *older branches* terete; *fertile aments* long and pendulous Banks of the Hudson, near Troy, N. Y., apparently native. *Beck.* A tree 60—70 feet high, with a cylindric trunk. Leaves 2½—4 inches in diameter, on long petioles. April. *Necklace Poplar.*

6. P. HETEROPHY'LLA.

Leaves roundish-ovate, obtuse, uncinately toothed, cordate and somewhat auricled at base, the sinus small, tomentose when young. A tree 60—70 feet high, found in swamps. Branches cylindric. Leaves with auriculate lobes at base which often conceal the insertion of the petiole. May. *Various-leaved Poplar.*

7. P. CA'NDICANS.

Leaves ovate-cordate, acuminate, obtusely and unequally serrate, whitish beneath, reticulate-veined, somewhat 3-nerved; *petioles* hirsute; *buds* resinous; *branches* terete. This tree is sometimes met with in New England, growing about houses as a shade tree. It is 40—50 feet high, and 18—30 inches in diameter. Bark smooth, greenish. Foliage copious, dark green. April. *Balm of Gilead.*

8. P. CANADE'NSIS.

Leaves roundish-ovate, deltoid, acuminate, subcordate, unequally serrate, smooth, glandular; *petioles* compressed; *younger branches* angled. The cotton-tree grows 70—80 feet high, in N. Y. and Vt. The fertile aments are 6—8 inches long, and pendulous. The seeds are clothed with a white, cotton-like down which gives name to the tree. Buds sealed against the frosts and rains with resin. April. *Cotton Tree.*

9. P. DILATA'TA.—*Leaves* smooth, acuminate, deltoid, serrate, the breadth equaling or exceeding the length; *trunk* lobed and sulcate. This tree is native in Italy as its name imports. It was early brought to this country, and has been planted about many a dwelling and in village streets. Its rapid growth is the only commendable quality it possesses, while the huge worms by which it is often infested render it a nuisance. *Lombardy Poplar.*

ORDER CXXX. BALSAMIFLUÆ. *The Liquidambar Tribe.*

Aments monœcious, roundish, with achlamydeous flowers.
STERILE.—*Anth.* numerous, oblong, subsessile, with scales intermixed.
FERTILE.—*Ova.* 2-celled, collected into a globe, each surrounded by a few scales.
Styles 2, long. *Fr.* a kind of strobile, composed of the indurated scales and capsules.
Caps. 2-beaked, 2-celled, opening between the beaks. *Sds.* several, winged.

An order consisting of a single genus of trees. Leaves alternate, palmate-lobed, with deciduous stipules. The fragrant resin, *liquid storax*, is the product of several species.

LIQUIDA'MBAR.

Character the same as that of the order.

Lat. *ambar*, amber, and *liquidum*, fluid; a strong balsamic substance which has been compared to amber, flows from the tree.

L. STYRACI'FLUA.

Leaves palmate, with acuminate, serrate lobes; *veins* villous at their bases. The sweet gum or gum-tree is disseminated throughout the U. S. With a

diameter of 5 feet it arises to the hight of 60. The trunk is covered with a deeply furrowed bark. The young twigs are yellowish, putting forth leaves of a rich green, which are deeply divided into 5 lobes more regularly formed than those of the rock maple. The fruit is in a globular, compact ball, suspended by a slender pedicel, consisting of numerous capsules, each containing 1 or 2 seeds. When wounded in summer, a gum of an agreeable odor is distilled from the trunk. May. *Sweet Gum.*

ORDER CXXXI. PLATANACEÆ. *The Plane-tree Tribe.*

Aments monœcious, globose, with achlamydeous flowers.
STERILE.—*Sta.* single, with only small scales intermixed. *Anth.* 2-celled, linear.
FERTILE.—*Ova.* terminated by a thick style with one side stigmatic.
Fr.—Nut, clavate, tipped with the persistent, recurved style. *Seed* solitary albuminous.

An order consisting of a single genus of trees, with alternate, palmately-lobed leaves. Stipules sheathing, scarious.

PLA'TANUS.

Character the same as that of the order.

Gr. πλατυς, broad; in reference to the ample foliage.

P. OCCIDENTA'LIS.

Leaves lobed, angular; *branches* whitish. The plane-tree is native of all the U. S., and is by far the largest (though not the loftiest) tree of the American forest. On the margins of the great rivers of the West, trees are found whose trunks measure from 40 to 50 feet in circumference, or more than 13 feet in diameter. In N. England it also grows to magnificent dimensions. It flourishes in any soil, but is most frequently met with on the stony borders and beds of streams. Leaves very large, tomentose beneath when young. Flowers in globular aments or balls, which hang upon the tree on long pedicels most of the winter. The bark is yearly detached from the trunk in large scales leaving a white surface beneath. May. *Plane-tree. Button-wood. Sycamore.*

ORDER CXXXII. URTICACEÆ.

Fls.—Monœcious, diœcious or polygamous; in panicles, aments or dense heads.
Cal.—Membranous, lobed, persistent.
Sta.—Definite, distinct, inserted into the base of the calyx and opposite its lobes.
Ova.—Free, simple, 1-ovuled. *Style* 1.
Fr.—Achenium or utricle, surrounded by the membranous or fleshy calyx.

A large order of trees, shrubs and herbs, the two former usually lactescent. Leaves alternate, rough or covered with stinging hairs, often stipulate. They are widely diffused throughout the world.

Properties.—The juice is almost always deleterious, sometimes in a high degree. It contains *caoutchouc.* The celebrated *Bohon Upas*, the most deadly of all poisons, is the concrete juice of Antiaris toxicaria of the Indian Archipelago. Its poisonous property is said to be due to the presence of *strychnia.* Meanwhile the famous *cow tree* of S. America yields a copious supply of milk which is rich and wholesome. *Gum lac* is obtained abundantly from Ficus Indica. The renowned *Banyan tree* is Ficus religiosa. In this order are also found many excellent fruits. *Figs* are the fruit of Ficus Carica, &c. *Bread fruit* is the compound fruit of Artocarpus; *mulberries* of Morus nigra. *Fustic*, a yellow dye is the wood of M. tinctoria of S. America. The use of *hemp* in the manufacture of cordage is well known, as are likewise the uses of the *hop.* The nettles are remarkable for their stinging, venomous hairs.

This order is composed of four principal suborders, viz: ARTOCARPEÆ, MOREÆ, URTICEÆ, and CANNABINEÆ, of which the three last are represented in the following genera.

Conspectus of the Genera.

Herbs . . .	Lvs. simple. Stamens 4.	Fls. spicate or paniculate.	Fertile calyx 2-sepaled.	*Urtica.*	1
			Fertile calyx 0. . . .	*Bœhmeria.*	5
		Flowers capitate, involucrate. . . .		*Parietaria.*	2
	erect.	Leaves palmately 5—7-foliate. Stamens 5. . . .		*Cannabis.*	3
	climbing. Diœcious. Stamens 5. Fertile flowers in aments.			*Humulus.*	4
Trees and shrubs . . .	Flowers in cylindric spikes, not enclosed.			*Morus.*	6
	Flowers clustered together within a fleshy receptacle. .			*Ficus* (omitted).	

1. U'RTICA.

Flowers monœcious, sometimes diœcious. *Sterile.*—Calyx 4-sepaled, with a cup-shaped, central rudiment of an ovary; stamens 4. *Fertile.*—Calyx 2-leaved, persistent, at length surrounding the shining, compressed achenium; style 1.

Lat. *uro*, to burn; in reference to the stinging species. Herbs, often with stinging hairs. Juice watery. Lvs. accompanied with stipules. Fls. clustered, axillary, green.

* Leaves alternate.

1. U. CANADE'NSIS. U. Canadensis and divaricata. *L.*

Hispid and stinging; *leaves* ovate, acuminate, serrate; *panicles* axillary, divaricate-branching, shorter than the petioles. In damp places. Stem 2—6 feet high. Leaves broadly ovate, 3—5 inches long, regularly toothed, often with a small sinus at base, more or less hispid both sides, often nearly smooth. Lower petioles 3 inches long. Flowers minute, in axillary panicles which vary from 1 to 3 or 4 inches in length, the lower ones generally barren. July, Aug. Per. On account of its tough fibres it has been proposed as a substitute for hemp. *Hemp Nettle.*

β. stem 2—3 feet high; *panicles* shorter than the lower petioles.

* * Leaves opposite.

2. U. DIOI'CA.

Hispid and stinging; *leaves* cordate, coarsely serrate; *flowers* diœcious; *spikes* much branched, in pairs. Grows by roadsides, &c. Stem 2—4 feet high, branching, obtusely 4-angled, with opposite short-stalked leaves which are 3—4 inches long and about ½ as wide. Flowers small, green, in axillary clusters, of mean aspect, corresponding with the insidious character of the plant. "Its power of stinging resides in minute, tubular hairs or prickles which transmit a venomous fluid when pressed." *Bigelow.* July, Aug. Per. *Common Nettle.*

3. U. PU'MILA.

Glabrous; *leaves* ovate, acuminate, 3-nerved, serrate; *lower petioles* as long as the leaf; *flowers* monœcious, triandrous, in corymbed heads shorter than the petioles. In waste places, about buildings, &c. Stem fleshy, semi-transparent when growing in shades, smooth and shining. Leaves on long petioles, especially the lower ones, smoothish, about 2 inches long and ⅔ as wide. Flowers in short heads or corymbs, axillary. A species without stings. Aug. Sept. Per. *Richweed.*

4. U. URENS.

Leaves broadly elliptic, about 5-nerved, acutely serrate; *clusters* glomerate, by pairs. An annual weed, in cultivated grounds. Stem 12—20 inches high, hispid with venomous stings, branching. Leaves 1—2 inches long, ⅔ as broad, on short petioles and with large serratures. Stipules small, lanceolate, reflexed. Flowers in drooping, pedunculate clusters about as long as the petioles, both the sterile and fertile in the same axil. Rare. Introduced. June, July. Ann. *Burning Nettle.*

Three or four other species are described by authors as natives of the Northern States, but on careful examination they will probably be found mere varieties of some of the foregoing species.

2. PARIETA'RIA.

Flowers monœcious-polygamous, in clusters surrounded by a many-cleft involucre; calyx 4-parted; stamens 4, at first incurved, then expanding with an elastic force; ovary and style 1; achenium polished, enclosed within the persistent calyx.

Lat. *paries*, a wall; some of the species prefer to grow upon old walls, &c. Herbs, with a watery juice and usually with alternate leaves. Clusters axillary.

P. PENNSYLVA'NICA.

Leaves oblong-lanceolate, veiny, tapering to an obtuse point, punctate with opaque dots; *involucre* longer than the flowers. A rough, pubescent herb, found in damp, rocky places, Vt. and N. Y. Stem erect, simple or sparingly branched, 6—12 inches high. Leaves alternate, entire, hairy and rough, about ½ inch wide and 3 or 4 times as long, petiolate, and ending with an obtuse acumination. Segments of the involucre about 3, lance-linear. Flowers dense, greenish and reddish-white. Rare. Jn. Ann. *Pellitory.*

3. CA'NNABIS.

Flowers diœcious. *Sterile.*—Calyx 5-parted. *Fertile.*—Calyx entire, oblong, acuminate, opening longitudinally at the side; styles 2; achenium? 2-valved, enclosed within the persistent calyx.

Arabic *ganeb*, hemp. Annual herbs with watery juice. Lvs. opposite, digitate. Fls. axillary, in cymose panicles or sessile.

C. SATI'VA.

Leaves palmately 5—7-foliate. The hemp was introduced, originally from India, but it springs up spontaneously in our hedges and waste grounds. It is a tall, erect plant, with handsome petiolate leaves. Leaflets lanceolate, serrate, 3—5 inches long, one fifth as wide, the middle one the largest. Flowers small, green, solitary and axillary in the barren plants, spiked in the fertile ones. It is cultivated in many countries for the sake of its fibre which is stronger than that of flax, and is the best of all materials for cordage and sail-cloth. The seeds are nutritious, but the leaves are stimulant and narcotic, producing intoxication. June. *Hemp.*

4. HU'MULUS.

Flowers diœcious. *Sterile.*—Calyx 5-sepaled; stamens 5; anthers with 2 pores at the summit. *Fertile.*—Bracts imbricate, large, entire, concave, persistent, 1-flowered; calyx membranous, entire, persistent; styles 2; achenium invested by the thin calyx.

Lat. *humus*, moist earth; as the hop grows only in rich soils. Perennial herbs, twining with the sun. Juice watery. Lvs. opposite. Fls. in axillary panicles and pedunculated aments.

H. LU'PULUS.

The hop vine is found wild in hedges, &c., throughout this country, and is, as every one knows, extensively cultivated for the sake of its fertile aments which are chiefly used as a preservative in beer. It has a long, annual stem of rapid growth, always twining with the sun, rough backwards with reflexed prickles. Leaves very rough, generally 3-lobed, deeply cordate at base, on long stalks. Flowers of the barren plants extremely numerous, paneled, greenish; those of the fertile, in aments with large scales. In the cultivation of the hop it has been found *profitable* to plant a few layers of the barren vines among the fertile ones, as the produce is thus increased in weight through the fertilization of the seeds. Aug. *Common Hop.*

5. BŒHME'RIA.

Flowers monœcious or diœcious. *Sterile.*—Calyx 4-parted, with lanceolate, acute segments; stamens 4. *Fertile.*—Achlamydeous; ovary and style 1, in the axil of a bract; achenium compressed, margined.

Named for G. F. Bœhmer, a German botanist. Herbs with a watery juice. Flowers clustered.

B. CYLI'NDRICA.

Herbaceous; *leaves* opposite, ovate-lanceolate, acuminate, dentate, smooth; *flowers* diœcious; *sterile spikes* glomerate, interrupted, *fertile* cylindric. A coarse, nettle-like plant, in swamps. Stem slender, obtusely 4-angled, channeled on each side, 2—3 feet high. Leaves 3-nerved, 3—5 inches long, ½ as wide, on long petioles. Flowers minute, the fertile ones in axillary, cylindric spikes, 1—2 inches in length, the barren spikes rather longer and more slender. July. Aug. *False Nettle.*

6. MORUS.

Flowers monœcious, rarely diœcious. *Sterile* in loose spikes; calyx 4-parted. *Fertile* in dense spikes; calyx 4-parted; styles 2; achenium compressed, enclosed within the baccate calyx.

Celtic. *mor.* black; the color of the fruit of some of the species. Trees with a milky juice. Lvs alternate. Fls. in small, axillary, pedunculate spikes.

1. M. RUBRA.

Leaves cordate, ovate, acuminate, or 3-lobed, equally serrate, scabrous, pubescent beneath; *fertile spikes* cylindric. This tree varies greatly in hight according to its situation. In N. England, where it is not very common, it is but a shrub 15—20 feet high. In the Middle and Western States it attains the elevation of 50—60 feet, with a diameter of 2 feet. Trunk covered with a grayish bark, much broken and furrowed. Wood fine-grained, strong and durable. Leaves 4—6 inches long, ⅔ as wide, entire or divided into lobes, thick, dark green. Fls. small. Berries of a deep red color, compounded of a great number of small ones, of an agreeable, acid taste. May. *Red Mulberry.*

2. M. ALBA.—*Leaves* cordate, oblique at base, entire or lobed, unequally serrate, smoothish. Native of China. Cultivated for the sake of its leaves as the food of silk worms. A tree of humble growth. Leaves 2—4 inches long, ⅔ as wide, acute, petiolate. Flowers green, in small roundish spikes or heads. Fruit of a yellowish white, insipid. *White Mulberry.*

β. multicaulis; leaves very large (4—7 inches long, ⅔ as broad). Shrub. *Chinese Mulberry.*

CLASS II. GYMNOSPERMS.

Ovules not enclosed in an ovary, fertilized by the pollen without the intervention of a pistil, and becoming truly NAKED SEEDS, the carpel being represented by a flat open scale or entirely wanting. Embryo with 2 opposite, or several whorled cotyledons.

ORDER CXXXIII. CONIFERÆ. *The Fir Tribe.*

Fls.—Monœcious or diœcious, destitute of calyx or corolla.
Sterile, monandrous or monadelphous, collected in a kind of loose ament.
Anth.—2 or many-lobed, often tipped with a crest. *Pollen* large, usually compound.
Fertile, in aments composed of open, scale-like carpels, or solitary and without a carpel.
Ovary, style and *stigma* wanting. *Ovules* 1, 2 or many, erect or inverted.
Fr.—A strobile (cone), or a solitary seed. *Integuments* hard and crustaceous.
Embryo in the axis of oily albumen.

Trees or shrubs, with branching trunks, abounding in resinous juice. Leaves scattered or fascicled, linear or acerose (rarely lanceolate), rigid, parallel-veined, and generally evergreen. They are natives of all climates but most abundant in the temperate zones, those of the southern, however, very different from the pines, spruces, larches and cedars of the northern.

Properties. Few orders can be named, which are of more importance to mankind, whether in reference to their invaluable timber or their resinous secretions. *Turpentine, tar, pitch* and *resin* are the product of the pines. *Burgundy pitch* is yielded by Pinus sylvestris of Europe; *Venetian turpentine*, by the Larix; *oil of Savin* by Juniperus Sabina of Europe, &c.

Conspectus of the Genera.

Fruit	a woody cone.	Leaves scale-like, imbricate. Fertile scales 4—8-ovuled.	*Cupressus.*	2
		Leaves scale-like, imbricate. Fertile scales 2-ovuled.	*Thuja.*	3
		Leaves linear or acerose.	*Pinus.*	1
	a fleshy berry with 3 bony seeds. Leaves mostly acerose.		*Juniperus.*	4
	a fleshy drupe with a single seed. Leaves linear, 2-ranked.		*Taxus.*	5

1. PINUS.

Flowers monœcious. *Sterile.*—Scales peltate, each bearing 2, sessile, 1-celled anthers. *Fertile*, in ovoid aments. Carpellary scales closely imbricate, each bearing a pair of ovules adhering to the base inside, and subtended by a bract outside; fruit a woody strobile or cone; seeds winged, cotyledons 2—15.

Celtic, *pin* or *pen*, a rock or mountain; many species of this noble genus prefer such situations. Lvs. linear or acerose, solitary or fasciculate, mostly evergreen. Aments of the barren flowers numerous, deciduous.

§ Leaves evergreen, in fascicles of 2—5, sheathed at base, acerose. Scales of the cone thickened at the summit. Pinus *vera.*

1. P. RESINO'SA. *Lambert.* P. rubra. *Mx.*

Leaves in pairs, channeled, elongated, with elongated sheaths; *cones* ovoid-conic, rounded at the base, subsolitary, about half as long as the leaves; *scales*

unarmed, dilated in the middle. It abounds in the northern parts of the U. S. and in Canada, attaining the hight of 80 feet, with a trunk 2 feet in diameter, very straight and uniform. Bark smoother, and of a clearer red than other pines. Leaves chiefly collected towards the ends of the branches, always in pairs, 5—8 inches in length, the sheaths ½—1½ inch. This pine affords a fine-grained, resinous timber of much strength and durability, and highly valued in architecture. May. *Red Pine. Norway Pine.*

2. P. BANKSIA'NA. *Lamb.* P. rupestris. *Mx.*

Leaves in pairs, rigid, curved, acute, terete upon the back and channeled above, margins somewhat scabrous; *cones* ovate-acuminate, recurved, tortuous; *scales* unarmed, obtuse, smooth. A small tree, with long, spreading, flexible branches, abounding in barrens, in Me. and British America. Leaves about an inch in length. Cones nearly twice as long as the leaves, usually in pairs. April. May. *Scrub Pine.*

3. P. INOPS.

Leaves in pairs, rather short, obtuse, rigid, channeled above, terete beneath, margins obscurely serrulate; *cones* recurved, ovoid-oblong, as long as the leaves; *scales of the cone* compact, obtuse at base, with a straight, subulate point. A tree 15—25 feet high, on barrens in the Middle States. Branches straggling, and with the trunk, covered with a rough, blackish bark. Leaves 1—2 inches long. The wood abounds in resin. May. *Jersey Pine.*

4. P. VARIA'BILIS. *Lamb.* P. mitis. *Mx. f.*

Leaves 2—3 together, channeled on the inner surface; *cones* ovoid, subsolitary; *scales* armed with short, incurved spines. Widely diffused throughout the country, attaining the hight of 50—60 feet. Leaves dark green, 5—6 inches long, covering the branchlets. Cones 2—3 inches long, rugged with the projecting point of the scales. It furnishes close-grained and moderately resinous timber which is used in immense quantities for all kinds of architecture. May. *Yellow Pine. Spruce Pine.*

5. P. RI'GIDA.

Leaves in 3s, with short sheaths; *cones* pyramidal-ovoid, clustered; *scales* with reflexed spines. Common in barren, sandy plains, which it often exclusively occupies. It is of moderate hight at the north (25—30 feet), but attains a great hight in the Southern States. The trunk, which is seldom straight, is covered with a very thick and rough bark cleft with deep furrows. Leaves 4—6 inches long. Cones usually several together, 2—3 inches long. The wood is heavy with resin, little used in architecture except for floors, but makes excellent fuel. May. *Pitch Pine.*

6. P. STROBUS.

Leaves in 5s, slender, with very short sheaths; *cones* solitary, cylindric, loose, pendant longer than the leaves. This pine is one of the most majestic and the most useful forest trees of this, or of any other country. The trunk is perfectly straight, covered with a comparatively smooth bark, and, in some instances, 5—7 feet in diameter, and 100 feet in hight without a limb; then, sending out a few branches, it forms a tufted head far above the surrounding forest. The branches are given off in whorls which are very observable in young trees. The leaves are about 4 inches long, numerous, slender, of a bluish green, forming an extremely soft and delicate foliage. The wood is soft, fine-grained, easily wrought, very durable, and is used in immense quantities in all varieties of architecture. The large trunks are in particular sought for the masts of ships. May. *White or Weymouth Pine.*

§ § Leaves deciduous, in fascicles of 12—25, acerose. Scales thin at edge. LARIX.

7. P. AMERICA'NA. Larix Americana. *Mx.* P. pendula and microcarpa of authors.

Leaves short, in dense fascicles, without sheaths, very slender; *cones* oblong, inclining upwards even when the branches are pendulous; *scales* thin and inflexed on the margin; *bracts* elliptical, often hollowed at the sides, abruptly acuminate with a slender point. A beautiful tree, often seen in our shrubberies, and thinly interspersed, in forests throughout N. England. It is remarkably distinguished from the pines by its deciduous leaves, the branches being bare nearly half the year. The tree arises 80—100 feet, with a straight and slender trunk and horizontal branches. Leaves 1—2 inches long, collected in bunches of 12—20 on the sides of the branches. Cones deep purple, ½—1 inch long. The wood is considered most valuable of all the pines or spruces, being very heavy, strong and durable. Apr. May. *American Larch.*

§ § § Leaves evergreen, solitary, linear. Scales of the cone even and attenuated. ABIES.

8. P. CANADE'NSIS. *L.* Abies Canadensis. *Mx.*

Leaves linear, flat, obscurely denticulate, glaucous beneath, in 2 rows; *cones* ovoid, terminal, scarcely longer than the leaves; *scales* rounded, entire. A well known evergreen inhabitant of the rocky, mountainous woods of New England, commonly attaining the hight of 70—80 feet. The trunk is large in proportion, straight, covered with a rough bark. Branches brittle and nearly horizontal, with pubescent twigs Leaves 6—8 lines in length, less than 1 line wide, arranged in 2 opposite rows. Cones very small. The wood of the hemlock is soft, elastic, of a coarse, loose texture, not much valued for timber, but is sometimes substituted for pine. The bark is extensively used in tanning. May. *Hemlock Spruce.*

9. P. BALSA'MEA. *L.* Abies balsamifera. *Mx.*

Leaves linear, flat, obtuse, glaucous, with a grooved line above and an elevated one beneath; *cones* cylindric, erect, reflexed on the margin; *scales* broad, compact; *bracts* obovate, shorter than the scale. A beautiful evergreen, common in humid forests of the northern part of the U. States. Its branches are nearly horizontal, gradually becoming shorter upwards, forming a regularly pyramidal head. The leaves are little larger than those of the hemlock (8—10 lines long) growing upon the sides and top of the branches, of a bright green above and silvery white beneath. Cones 2—3 inches in length. Bark smooth, abounding in reservoirs filled with a resin or balsam which is considered a valuable medicine. May. *Fir Tree. Balsam Spruce.*

10. P. ALBA. *Ait.* Abies alba. *Mx.*

Leaves 4-sided, incurved; *cones* lax, pendulous, subcylindric, with entire, broadly obovate, somewhat 2-lobed scales. Very abundant in the northern sections of the U. States, preferring humid and rocky woods. Hight 50 feet. Trunk 1—2 feet in diameter at the base, regularly diminishing upwards. Lower branches longest, the others becoming gradually shorter upwards. Leaves ½—¾ inch in length, placed on all sides of the branches. Cones small. The timber is useful in the frames of buildings, &c. May. *White Spruce.*

11. P. NIGRA. *Ait.* Abies nigra. *Mx.*

Leaves 4 cornered, scattered, straight, erect; *cones* ovoid, pendulous; *scales* elliptical-obovate, erosely dentate at the edge, erect. This fine tree abounds in the northern parts of the U. S. where dark, mountain forests are often wholly composed of it. It is a large tree, 70—80 feet high, with a straight trunk and a lofty pyramidal head. The leaves thickly cover the branches, are of a dark green color, little more than ½ inch in length. Cones 1—2 inches long. The timber is light, strong and elastic, and, although inferior to the white pine, is much used in architecture. That salutary beverage, *spruce beer*, is made from the young branches. May. *Black or Double Spruce.*

2. CUPRE'SSUS.

Flowers monœcious. *Sterile*, in an ovoid ament; scales peltate; anthers 4, sessile. *Fertile*, in a strobile; scales peltate, bearing 4—8, erect (orthotropous) ovules at base inside; seed angular, compressed; integuments membranous; cotyledons 2 or more.

From the Isle of *Cyprus*, where the Cypress is very abundant. Trees, with evergreen, flat, squamose, imbricated leaves. Fertile aments becoming indurated cones.

C. THYOI'DES.

Branchlets compressed; *leaves* imbricate in 4 rows, ovate, tuberculate at base; *cones* spherical. This tree is thinly disseminated in N. England, but quite common in the Middle States. It usually occurs in swamps, which it densely and exclusively occupies. Hight 40—60 feet. The leaves consist of short, minute, evergreen scales, covering the finely divided branchlets, in 4 imbricated rows, and each one furnished with a minute gland or tubercle on the back. The wood is white, fine-grained, and wonderfully light, soft and durable. Used in the manufacture of shingles, pails, fences, &c. Posts made of this cedar it is said will last 50 years. May. *White Cedar.*

3. THUJA.

Flowers monœcious. *Sterile*, in an imbricated ament; anthers 4, sessile. *Fertile*, in a strobile, each scale bearing 2 erect ovules at the base inside; seed winged; integument membranous; cotyledons 2 or more.

Gr. θυω, to sacrifice; its wood, when burnt, gives out an agreeable odor, and was anciently used in sacrifices. Trees or shrubs. Leaves evergreen, squamose, imbricate.

T. OCCIDENTA'LIS.

Branchlets ancipital; *leaves* imbricate in 4 rows, rhomboid-ovate, appressed, tuberculate; *cones* oblong, the inner scales truncated and gibbous below the tip. This tree is often called *white cedar*, and from its resemblance might easily be mistaken for the *Cupressus thyoides*. It abounds in the British Provinces and in the northern parts of the U. S. on the rocky borders of streams and lakes, and in swamps. It has a crooked trunk, rapidly diminishing in size upwards, throwing out branches from base to summit. The evergreen foliage consists of branchlets much more flat and broad than those of the white cedar. Cones terminal, consisting of a few long, loose scales, unlike the round, compact cones of that tree. The wood is very light, soft and durable. Its most important use is for fences. May. *Arbor vitæ.*

4. JUNI'PERUS.

Flowers diœcious, rarely monœcious. *Sterile.*—Ament ovate; scales verticillate, peltate; anthers 4—8, 1-celled. *Fertile.*—Ament globose; scales few, united at base, concave; ovules 1 at the base of each scale; berry formed of the enlarged, fleshy scales containing 2—3 bony seeds; cotyledons 2.

Celtic, *juneprus*, rough or rude. Trees or shrubs. Lvs. evergreen, mostly acerose, opposite or in whorls of 3.

1. J. COMMU'NIS.

Leaves ternate, spreading, subulate, mucronate, longer than the berry. An evergreen, spreading shrub, with numerous, prostrate branches, growing in dry woods and hills, often forming entangled beds. Leaves arranged in whorls of 3, 5—8 lines long, acerose-lanceolate, ending in a sharp, bristly point, channeled and glaucous on the midrib above, keeled and green below. Barren flowers in small, axillary aments or cones; fertile ones on a distinct shrub, small, axillary, sessile. Berries roundish, oblong, dark blue, ripening the second year from the flower. They are then sweetish, with a taste of turpentine. In medicine they are diuretic and cordial. May. *Juniper.*

2. J. VIRGINIA'NA. *L.* J. Sabina. *Hook.*

Upper leaves imbricate in 4 rows, ovate-lanceolate, pungently acute, appressed, older ones acerose, cuspidate, spreading; *trunk* arboreous. Found throughout the U. S., but chiefly in the maritime parts, growing in dry, rocky situations. It is a tree of middle size, sending out numerous, horizontal branches. Leaves dark green, the younger ones small, ovate, acute, scale-like, overlaying each other in 4 rows, upon the subdivided branchlets; the older ones ½ inch long. Flowers inconspicuous, the staminate in oblong, terminal aments, ¼ inch long; the fertile on separate trees, producing small, bluish berries covered with a white powder. The wood is fine-grained and compact, of a reddish hue, very light and durable. It is used for fences, aqueducts, tubs and pails, and in the manufacture of drawing pencils. April. May. *Red Cedar.*

β. *prostrata; leaves* ovate, submucronate, glandular in the middle, appressed; *berries* tubercular; *stem* prostrate, creeping. A shrub, on gravely shores, with creeping branches 4—8 feet long. *Prostrate Juniper.*

5. TAXUS.

Flowers diœcious or monœcious, surrounded with numerous scales. *Sterile.*—Stamens 8—10, monadelphous; anthers peltate, 6—8-celled, cells dehiscent beneath. *Fertile*, solitary, consisting of a single ovule, becoming in fruit a fleshy, 1-seeded drupe.

Gr. τοξον, an arrow; arrows were formerly poisoned with the juice of the *yew-tree.* Lvs. evergreen, linear, alternate.

T. CANADE'NSIS.

Leaves linear, mucronate, 2-ranked, revolute on the margin; *sterile receptacles* globose. A small, evergreen shrub, with the general aspect of a dwarf hemlock spruce (*Pinus Canadensis*). It grows on thin, rocky soils in shady places, 2—3 feet high. Leaves nearly an inch long, arranged in 2 opposite rows, on the sides of the branchlets. Staminate flowers in small, roundish, axillary heads. Drupes oval, concave or open at the summit, red and juicy when mature. May. *Dwarf Yew. Ground Hemlock.*

SUBDIVISION SECOND,

ENDOGENS, OR MONOCOTYLEDONOUS PLANTS.

STEM not distinguishable into bark, pith and concentric zones or layers of wood. GROWTH by irregular, internal accretions, consisting of bundles of woody fibre and vessels, successively descending from the leaves above, through the cellular tissue already formed. LEAVES mostly with simple, parallel veins, alternate, entire, frequently sheathing at base, and seldom falling off by an articulation. SEPALS and PETALS, when present, commonly in 3s. OVULES produced within an ovary. EMBRYO with one cotyledon, rarely with two, the second being much smaller than, and alternate with, the first.

CLASS III. AGLUMACEOUS ENDOGENS.

Flowers without glumes. Organs developed on the usual and normal plan, consisting of stamens and pistils, either or both, surrounded by verticillate, floral envelops; or the latter are wanting, and the stamens and pistils are achlamydeous.

ORDER CXXXVI. ARACEÆ. *The Arum Tribe.*

Fls.—Mostly monœcious and achlamydeous, arranged upon a naked or spathaceous spadix.
Perianth, when present, consisting of 1—6 parts.
Sta.—Definite or indefinite, hypogynous, very short. *Anth.* ovate, extrorse.
Ova.—Free, 1—several-celled. *Stigma* sessile.
Fr.—Berry succulent or dry. *Seeds* solitary or several, with fleshy albumen.

Herbs, or tropical shrubs. Rhizoma or cormus fleshy. Leaves sheathing at base, often with branching veins, and sometimes compound. They are abundant in tropical regions, more rare in temperate, one only, Calla palustris, extending to the northern trigid zone.

Properties. An acrid, volatile principle pervades the order, which is, in some instances, so concentrated as to become poisonous. The corms and rhizomas abound also in starch, which in some cases, when the volatile acridity is expelled in drying or cooking, is edible and nutritious.

Conspectus of the genera.

Leaves broad.	Spadix in a spathe, and covered with flowers, cylindric.		Berry 1-seeded.	*Peltandra.*	2
			Ber. many-seed'd.	*Calla.*	3
			oval, preceding the leaves.	*Symplocarpus.*	6
		and naked above. Stem a corm.		*Arum.*	1
	Spadix naked, yellow, on a clavate scape.			*Orontium.*	4
Leaves linear-ensiform.	Scape leaf-like. Spadix lateral.			*Acorus.*	5

1. ARUM.

Flowers sometimes diœcious. spathe cucullate, convolute at base; perianth 0; spadix cylindric, naked above, *staminate* below the middle and pistillate at the base; berry 1-celled, many-seeded.

Coptic, *aron*, the name of the Egyptian species, A. colocasia. Herbs, perennial.

1. A. TRIPHY'LLUM.

Acaulescent; *leaves* trifoliate, mostly in pairs, leaflets oval, acuminate; *spadix* clavate; *spathe* ovate, acuminate, flat and deflected above. A curious and well known inhabitant of wet woodlands. The stem is a rugose, fleshy, subterraneous corm giving off radicles in a circle from the edge. Scape 8—12 inches high, erect, round, embraced at the base by the long sheaths of the petioles. Leaves 2, on long stalks, each consisting of 3 smooth leaflets, 2—7 inches long, ½ as wide. Spathe green without, usually variegated within with stripes of dark purple alternating with pale green. Spadix much shorter than the spathe varying from green to dark purple. Fruit a bunch of bright scarlet berries. The corm loses its fiercely acrid principle by drying, and is then valued as a carminative, &c. May, Jn. *Dragon Root.*

β. atrorubens (*Dewy.* A. atrorubens. *L.*); *spathe* sessile, spreading horizontally above, dark brown. Plant rather smaller, and with a disagreeable odor.

2. A. DRACO'NTIUM.

Acaulescent; *leaf* mostly solitary. pedate; *leaflets* oblong-lanceolate; *spadix* subulate, longer than the convolute, oblong spathe. Less common in N. England than the former species, found in wet places, banks of streams, &c. Stem a fleshy, subterraneous corm. Scape slender, 6—12 inches high. Leaf on an erect, sheathing petiole, which is dichotomous above, each half bearing 2—4 leaflets with an odd one at the fork. Leaflets rather smaller than in *A. triphyllum.* Spathe green, 1—2 inches long, rolled into a tube at base. Spadix slender, with its long, tapering point much exserted. Fruit a bunch of red berries. Jn. Jl. *Green Dragon.*

2. PELTA'NDRA.

Spathe convolute; spadix covered with flowers, staminate above, pistillate below; perianth 0; stamens peltate; berry 1-celled, 1-seeded.

Gr. πελτη, a shield or target, ανδρες, stamens; from the character. Perennial herbs.

P. VIRGINI'CA. *Raf.* Arum. *L.* Calla. *Bw.* Lecontia. *Cooper.* Rensseleria. *Beck.* } Caladium. *Lind.* }

Acaulescent; *leaves* oblong, hastate-cordate, acute at apex, the lobes obtuse; *spathe* elongated, incurved; *spadix* covered with staminate flowers the greater part of its length. A smooth, dark green plant, in wet grounds. N. Y. and Ms. Leaves radical, numerous, 8—12 inches long, ½ as wide, on petioles as long as the scapes. Scapes many from the same root, 8—15 inches long. Spathe closely involving the spadix, green, 2—3 inches long, lanceolate, wavy on the margin. Spadix slender. acuminate, shorter than the spathe, bearing the ovaries and finally the berries in a dense cluster at its base. June. It is to be hoped that this persecuted plant will soon find, if it has not here found, a permanent abode.

3. CALLA.

Spathe ovate, spreading; spadix covered with flowers, staminate intermixed with, or above the pistillate; perianth 0; berry many-seeded.

Gr. καλλος, beautiful; a term well applied to some of the species. Perennial, aquatic herbs.

1. C. PALU'STRIS.

Leaves cordate; *spathe* ovate, flat; *spadix* covered with ovaries intermixed with stamens. A fine plant growing in shallow water. Rhizoma creeping, rooting at the joints. Leaves 2—3 inches long, $\frac{2}{3}$ as wide, on long stalks, involute at the acuminate point, smooth and entire. Scape smooth, green, roundish, thick, 4—6 inches high. Spathe clasping at the base, spreading, recurved, with an involute point, greenish yellow without, white and soft within. Spadix an inch in length. The rootstock is acrid, but Linnæus tells us that the Laplanders extract a wholesome bread stuff from it. July.
Northern Calla.

2. C. ÆTHIO'PICA.—*Leaves* sagittate-cordate; *spathe* cucullate; *spadix* with the sterile flowers above the fertile. A magnificent plant from Cape Good Hope, now often met with in green-houses and parlors. The leaves are very large, smooth and entire, on long, sheathing, radical footstalks. Scape smooth, round, arising a little above the leaves, 3—5 feet high. Spathe very large, white, involute at base, reflexed, and terminating abruptly in a long acumination. Spadix yellowish white, about half the length of the spathe. Flowers from Jan. to May. *Ethiopian Calla.*

4. ORO'NTIUM.

Spadix cylindric, covered with flowers; perianth 4—6-sepaled; stamens 4—6; ovary free; stigma sessile; fruit a dry berry or utricle.

The ancient Grecian name of a plant so called from its growing by the *Orontes*, a river in Asia Minor. Acaulescent, aquatic, perennial herbs. Fls. yellow, at the summit of the scape. Spathe radical.

O. AQUA'TICUM.

Leaves ovate-lanceolate; *spike* or *spadix* cylindric, on a clavate scape. This interesting plant is a native of inundated banks and pools, but not very common. The leaves are large (often becoming 10—12 inches long and $\frac{1}{3}$—$\frac{2}{3}$ as wide), smooth, of a deep-green, velvet-like surface above, paler beneath, on long, radical petioles. Scape thick and terete, about a foot in length, closely invested by the short spathe at base, and ending in a spadix of a rich yellow color covered with small, perfect, yellow flowers of an offensive odor,—the upper ones often tetramerous. May. *Golden Club.*

5. A'CORUS.

Spadix cylindric, covered with flowers; perianth 6-sepaled; ovary free; stigma sessile, minute; fruit dry, 3-celled, many-seeded.

Gr. α, privative, and κορη, the pupil of the eye; because supposed to cure maladies of the eye. Herbs with a fleshy rhizoma. Lvs. radical, ensiform. Scape foliaceous.

A. CA'LAMUS.

Summit of the scape above the spadix very long and leaf-like. Grows in wet soils throughout the U. States. The thick, prostrate, creeping rhizoma is highly valued for its aromatic flavor, its warm and pungent taste. The long, sword-shaped leaves are readily distinguished by the ridge running their whole length. The cylindrical spadix is about 3 inches long and ¼ inch in diameter, covered with small, green flowers, and bursting from the side of the leaf-like scape in June and July. *Sweet Flag.*

6. SYMPLOCA'RPUS.

Spathe ventricose; spadix oval, covered with perfect flowers; perianth deeply 4-parted, segments cucullate, cuneate, truncate, persistent, becoming thick and spongy; berries globose, 2-seeded, imbedded in the spadix.

Gr. συμπλοκη, connection, καρπος, fruit. Perennial, aquatic, acaulescent herbs.

S. FŒ'TIDUS. *Nutt.* Pothos fœtida. *Mx.* Ictodes fœtidus. *Bw.*

Leaves cordate-oval, acute; *spadix* subglobose, preceding the leaves. A common plant, growing in swamps, meadows and ditches, renowned for its odor, which is scarcely less offensive than that of the animal whose name it bears. Early in spring, the swelling spathe is seen emerging first from the ground or water, more or less covered with purplish spots, its edges partly infolded, and its point incurved. It encloses the spadix, which is oval, covered with flowers of a dull purple. The leaves, which arise after the flowers, are of a bright green, numerous, becoming very large (often 20 inches long and 12 wide). April. *Skunk Cabbage.*

ORDER CXXXVII. LEMNACEÆ. *The Duckweed Tribe.*

Fls.—2, achlamydeous, bursting through a membranous spathe.
Sta.—Definite, 2 or more.
Ova.—1-celled, with 1 or more erect *ovules*. *Style* short. *Stigma* simple.
Fr.—Utricle 1—several-seeded. *Seeds* with a fungous testa.

A small order of floating, annual herbs, consisting of a frond (stem and leaf confounded) sending down from the under surface roots which hang loosely in the water, and producing from the margin the spathaceous flowers.

LEMNA.

Sterile and fertile flowers in the same spathe, the former of 2 collateral stamens, the latter of a simple, carinate ovary, with a style and stigma.

Gr. λεμμα, a scale or husk; from the resemblance of the fronds.

1. L. TRISU'LCA.

Fronds elliptic-lanceolate, thin, serrate at one extremity and caudate at the other; *roots* solitary. Floating in ponds and pools of clear water. Fronds nearly ½ inch in length, diaphanous, with a tail-like appendage at base, obtuse at apex, the new ones issuing in a cruciate manner from lateral fissures in the margin of the old. Root a solitary fibre, ending in a sheath. Flowers very minute. Utricle sitting on the upper surface of the frond. June—Sept. *Ivy-leaved Duck-meat.*

2. L. MINOR.

Fronds nearly ovate, compressed; *root* solitary. This little floating plant occurs in dense patches on the surface of stagnant waters. The leaves, properly fronds, adhere 2—3 together, 1 inch in length, rather thick, and convex below. Root undivided, sheathed at the end. Flowers minute, from a cleft in the margin of the fronds, near the base. Jn.—Sept. *Lesser Duck-meat.*

3. L. GIBBA.

Fronds obovate, hemispherical beneath, nearly plain above; *root* solitary. Floating on the surface of stagnant waters. N. York. Fronds about a line in length, pellucid and reticulated beneath. June—Sept. *Gibbous Duck-meat.*

4. L. POLYRHI'ZA.

Fronds broad-ovate, a little convex beneath; *roots* numerous. Floating in stagnant waters. Fronds resembling flax-seed but larger (2—4 lines long), scattered on the surface of the water, of a firm, but succulent texture, becoming purplish. Roots in thick bundles of 8—10 black fibres from the under surface of the fronds. All these species are eaten by ducks and other aquatic birds. June—Sept. *Greater Duck-meat.*

ORDER CXXXVIII. TYPHACEÆ. *The Reed-mace Tribe.*

Fls.—Monœcious, arranged upon a spadix with no spathe.
Cal.—Sepals 3 or 0. *Corolla* 0.
Sta.—3—6. *Filaments* long and slender. *Anthers* cuneiform, erect.
Ova.—1, free, 1-celled, with a solitary pendulous *ovule*. *Style* short. *Stig.* 1—2.
Fr.—Utricle with an albuminous seed.

An order consisting of the two following genera only. They are herbs, growing in marshes or ditches. Stems without joints. Leaves rigid, ensiform, with parallel veins.

Genera.

Spadix of flowers	long and cylindrical	*Typha.*	1
	globose.	*Sparganium.*	2

1. TYPHA.

Spadix of flowers long, cylindric, dense. *Sterile.*—Stamens about 3 together, united into a common filament. *Fertile* flowers below the sterile; ovary pedicellate, surrounded at base by a hair-like pappus.

Gr. τυφος, a marsh; where all the species grow. Root perennial. Spadix terminal. Fls. very numerous.

T. LATIFO'LIA.

Leaves ensiform, concave within near the base; sterile and fertile spikes close together, or a little remote. A common, smooth, tall inhabitant of the water in muddy pools and ditches. The stem arises from 3 to 5 feet, round and smooth, leafy below, terminated by the large cylindric spikes. Spikes of a brown color, 6—10 inches in length, composed of slender, downy flowers so compact, particularly the fertile ones, as to be of considerable hardness. The upper portion is smaller, composed of the sterile flowers. Leaves somewhat sword-shaped, erect, 2—4 feet long and nearly an inch wide. They are called flags and made useful for weaving the seats of chairs, &c. July. *Cat-tail. Reed-mace.*

β. angustifolia. (T. angustifolia. *authors*); *sterile* and *fertile spikes* a little remote ($\frac{1}{4}$—2 inches). Found in the same situations with the former. A well marked variety, but differing only in the more slender habit, and less complete development of its parts.

2. SPARGA'NIUM.

Spadix of flowers globose. *Sterile.*—Calyx 3—6-sepaled. *Fertile.*—Calyx 3—6-sepaled; utricle turbinate, acuminate, 1—2-seeded.

Gr. σπαργανον, a band or fillet; in reference to the long, ribbon-like leaves. Root perennial. Fls collected in several dense, roundish heads, the sterile heads above the fertile.

1. S. RAMO'SUM.

Leaves triangular at base, their sides concave; *common flower-stalks* branched; *stigmas* 2, linear. Grows in pools and ditches where it is conspicuous among other reedy plants for its globular burrs of flowers. Stem 1—2 feet high, flexuous, round, with a few branches above. Leaves $\frac{1}{2}$—2 feet long, 4—8 lines wide, linear, arising above the stem, triangular towards the base, and sword-form upwards, tapering, but obtuse. Heads of flowers light green; fertile ones 2—5, the lowest generally raised on a short, axillary stalk; sterile ones above, more numerous, smaller, sessile. Aug. *Burr Reed.*

2. S. SIMPLEX. *Smith.* S. Americana. *Nutt.*

Lower leaves equal with, or exceeding the stem which is nearly simple; *floral ones* concave at base and erect; *stigma* always simple, ovate oblong, oblique, scarcely more than half the length of the style. Ponds and lakes. Stem 1—2 feet high, simple or divided at base. Leaves mostly radical, 1—$2\frac{1}{2}$ feet long, carinate at base. Fertile heads mostly sessile, generally 3, below the several barren ones. Scarcely distinct from the preceding. Aug. *Simple Burr Reed.*

3. S. NATANS. *Smith.* S. angustifolium. *Mx.*

Leaves floating, flat; *common flower-stalk* simple; *stigma* ovate, very short; *head of sterile flowers* subsolitary. Lakes and pools. Stem long and slender, and, with the leaves, floating upon the surface of the water. Leaves thin and pellucid. Heads of fertile flowers axillary, generally 2, mostly sessile. Sterile cluster terminal. Aug. *Floating Burr Reed.*

ORDER CXXXIX. NAIADACEÆ. *The Pond-weed Tribe.*

Fls.—Perfect or monœcious. *Calyx* 2—4-sepaled or 0.
Sta.—Definite. *Ovaries* 1, or 2—4, free, 1-ovuled. *Stigma* simple, often sessile.
Fr.—Dry, indehiscent, 1-celled, 1-seeded *Seed* pendulous. *Albumen* 0.

Water plants, with cellular leaves and inconspicuous flowers.

Conspectus of the Genera.

0. Flowers axillary,	solitary, diclinous, monandrous.	*Najas.*	2
	2 together, a sterile and fertile one.	*Zannichellia.*	3
	short, 2-flowered, borne on a long, tortuous peduncle.	*Ruppia.*	4
Spadix	linear, bearing the monœcious flowers in a double row.	*Zostera.*	1
	cylindric, covered with perfect, tetramerous flowers.	*Potamogeton.*	5

1. ZOSTE'RA.

Spadix linear, bearing the separated flowers in 2 rows on one side; perianth 0. *Sterile fl.*—Anther ovoid, sessile, parallel to the ovary. *Fertile fl.*—Ovaries 2, ovoid; style bifid; utricle 1-seeded.

Gr. ζωστηρ, a girdle; alluding to its ribbon-like leaves.

Z. MARI'NA.

Stem trailing, throwing out tufts of fibrous roots at the joints; *branches* floating, simple; *leaves* alternate, linear, entire, sheathing at base, 1—several feet in length; *receptacle* or *spadix* linear, flat, pale green, 2 inches long, issuing from a cleft in the base of the leaf, covered in front with a double series of naked flowers. Habits aquatic, growing in the sea on sandy banks and shallows, and is thence washed upon the shore by the waves. Like other sea-weeds, it is gathered for manure. Aug. Per. *Sea Wrack-grass. Eel-grass.*

2. NAJAS.

Flowers often diœcious. *Sterile.*—Calyx cylindric, 2-cleft; stamen 1 (rarely more); filament slender, often elongated; anther 4-valved, valves spreading. *Fertile.*—Perianth 0; style filiform; stigma 2—3-fid; capsule 1-seeded.

Gr. ναω, to flow; hence Ναις, or Ναιδες, Nymphs of the waters, after whom these little plants, for their habit, were named. Fls. axillary.

N. CANADE'NSIS. *L.* Caulinia flexilis. *Willd.* Fluialis flexilis. *Pers.*

Stems filiform, caespitose, dichotomously branching; *leaves* opposite or fasciculate in 3s, 4s or 6s, at the nodes, linear, obscurely denticulate, spreading, 1-nerved. A slender, flexible, rather erect, submersed aquatic, consisting of tufts of thread-like, knotted stems, 6—12 inches long. Leaves ½—1 inch long, ½ line wide, sessile and sheathing at base. Flowers solitary, sessile, axillary, very small, the fertile ones consisting of an oblong ovary tipped with a filiform style, with 2—3 stigmas at summit. In stagnant waters. August. *Water Nymph.*

β. (Caulinia fragilis. *Willd.*); *stems* and *leaves* rather rigid, the latter mostly opposite and recurved.

3. ZANNICHE'LLIA.

Flowers monœcious. *Sterile.*—Stamen 1; filament elongated. *Fertile.*—Calyx monophyllous; corolla 0; ovaries 4 or more, each with a single style and stigma, and becoming in fruit an oblong, incurved, subsessile achenium.

In honor of Zannichelli, an eminent botanist of Venice.

Z. PALU'STRIS.

Stems filiform, floating; *leaves* opposite, linear; *anthers* 4-celled; *stigmas* entire; *achenia* toothed on the back. In pools and ditches. Stem round, smooth, 1—2 feet long, branching, leafy. Leaves grass-like, 2—3 inches long, sessile. Flowers issuing from axillary bracts, small, 2 together, a sterile and fertile, the former consisting of a single, naked, erect, yellowish brown stamen, the latter of 4—6 ovaries which are free from the inflated, one-sided, 2—3-toothed calyx. July, Aug.

4. RU'PPIA.

Flowers perfect, 2 together on a spadix arising from the sheathing base of the leaves; perianth 0; stamens 4, sessile; ovaries 4, pedicellate, becoming in fruit 4 dry drupes or achenia.

Name in honor of Ruppi, a German botanist. Root perennial.

R. MARI'TIMA.

A grass-like plant, in salt marshes, Mass. Stems several feet long, filiform, branched, floating. Leaves 1—2 feet long, linear and setaceous, with inflated sheaths at base, all immersed. The common peduncle is contorted and spiral, and by winding and unwinding bears the naked, green flowers on the surface of the water as it rises or falls. July. *Sea Teazel-grass.*

5. POTAMOGE'TON.

Flowers perfect, on a spadix arising from a spathe; calyx 4-sepaled; anthers 4, alternate with the sepals; ovaries 4; achenia 4, sessile, flattened on one or two sides.

Gr. ποταμος, a river, γειτων, near. Mostly perennial, submersed aquatics, only the flowers arising above the surface of the water. Root perennial.

* Upper leaves floating.

1. P. NATANS. P. natans, fluitans and heterophyllum of *authors.*

Upper leaves long-petiolate, coriaceous, lanceolate, often subcordate at base, *lower leaves* submersed, long, membranous, linear-lanceolate. In ponds and sluggish streams. Stems round, branching, 6—20 inches long according to the depth ot the water. Leaves smooth, parallel-veined, upper $1\frac{1}{2}$—3 inches long, $\frac{1}{3}$—$\frac{2}{3}$ as wide, varying through all forms between elliptic-lanceolate and cordate-ovate, on petioles 2—6 inches in length, often reddish, issuing from bracts; lower leaves very variable in form and length, tapering to both ends. Peduncle 2—6 inches long, thick, bearing a spadix just above the water, 1—2 inches long, with greenish flowers. June. *Floating Pond-weed.*

α. *upper leaves* cordate-ovate, lower ones all petiolate.

β. *fluitans; upper leaves* oblong-lanceolate, tapering at base, lower linear.

γ. *heterophyllum; upper leaves* elliptical, lower linear. Plant reduced.

2. P. SETA'CEUM. *P.* P. diversifolium. *Bart.*

Upper leaves lanceolate, opposite, 5-nerved, on short petioles; *lower ones* submerged, sessile, filiform, alternate, dense, axillary. Common in pools and ditches. A very slender and delicate species, only the upper leaves arising to the surface. These are 6—10 lines long, 1—2 wide, acute at each end, on hair-like petioles 5—6 lines long. Spadices dense, short, 5—6 flowered. July. *Setaceous Pond-weed.*

** Leaves all submersed.

3. P. LUCENS.

Leaves lanceolate, flat, large, the short petioles continuing in a thick midrib; *spikes* long, cylindric, many-flowered. Rivers and lakes. Distinguished for its large leaves which are very pellucid, and, when dry, shining above, beautifully veined, 3—5 inches long, acuminate, $\frac{1}{2}$—1 inch wide, each with a lanceolate bract above its base. Spadix 2 inches long, of numerous, green flowers, on a peduncle 2 or 3 times as long, thick and enlarged upwards. June. Per. *Shining Pond-weed.*

4. P. PERFOLIA'TUM.

Leaves cordate, clasping the stem, uniform, all immersed; *spikes* terminal; *flowers* alternate. A common species, growing in ponds and slow waters, wholly below the surface except the purplish flowers. Stem dichotomous, very leafy, 6—10 inches long. Leaves alternate, apparently perfoliate near the base, 1½ inch long, ⅓ as wide, obtuse, pellucid. Spadix on a short peduncle (1—2 inches), few-flowered. Jl. *Perfoliate Pond-weed.*

5. P. PAUCI'FLORUM. *P.* P. gramineum. *Mx.*

Stem round, dichotomous, filiform; *leaves* linear, alternate, sessile; *flowers* few in a spadix. A delicate species, in rivers, &c. Leaves numerous, obtuse, tapering to the stipulate base, 2—3 inches long, a line wide, 1-nerved, of a bright green color. Peduncle an inch long, terminal, bearing 3—5 greenish fls. above the water, but ripening the seeds below. *Grass-leaved Pond-weed.*

6. P. PECTINA'TUM.

Leaves setaceous, parallel, approximate, in 2 rows; *flowers* few in a spike, scattered. The whole plant immersed in water except the spikes, which are terminal, composed of a few, remote, green flowers. Leaves very numerous, alternate, pointed, 1-ribbed, so arranged on 2 opposite sides of the stem as to give it a pectinate appearance. Jl. *Fennel-leaved Pond-weed.*

7. P. COMPR'ESSUM. *Torr.* P. zosterifolium. *Schum?*

Stem compressed, ancipital, flexuous; *leaves* broad-linear, obtuse; *spike* short, peduncle elongated. A very distinct species, in ponds and rivers. Stem 1—2 feet long, branching, weak, flattened, green, with sheathing stipules above the nodes. Leaves 3—4 inches in length, 2 lines wide, closely sessile, remote, the margins perfectly parallel, ending in an abrupt point. Spadix terminal, ½—1 inch long, on a peduncle 1—2 inches long, and bearing 5—25 flowers. July. *Grassy Potamogeton.*

ORDER CXL. ALISMACEÆ. *The Water Plantain Tribe.*

Fls.—Perfect or monœcious, regular, not on a spadix.
PERIANTH.—*Cal.* 3-sepaled, green. *Cor.* 3-petaled, colored (green in the suborder).
Sta.—Definite or indefinite, hypogynous.
Ova.—Carpels several, 1-celled and 1-seeded. *Styles* and *stigmas* several.
Fr.—Dry, indehiscent. *Seeds* straight or curved, destitute of albumen.

Aquatic herbs. Leaves parallel-veined. Flowers racemose or paniculate.

Conspectus of the Genera.

Petals	colored, sepals green.	Flowers all perfect. Stamens 6. . .	*Alisma.*	1
		Flowers monœcious. Stamens indefinite.	*Sagittaria.*	2
	green, like the calyx.	Anthers thick, short. Leaves cauline.	*Triglochin.*	3
		Anthers linear. Leaves all radical. .	*Scheuchzeria.*	4

1. ALI'SMA.

Flowers perfect; stamens 6; ovaries and styles numerous, aggregated, becoming in fruit numerous, distinct, compressed achenia.

Celtic *alis*, water; the place it inhabits. Perennial, caulescent. Leaves radical. Flowers paniculate. Sepals white.

A. PLANTA'GO.

Leaves oval, abruptly acuminate or cuspidate, subcordate; *achenia* obtusely 3-cornered. A common, smooth, handsome inhabitant of ponds and ditches.

Leaves resembling those of the common plantain, 4—6 inches long, $\frac{2}{3}$ as wide, ending in a short, abrupt point, 7—9-nerved, entire, on long, radical petioles. Scape 1—2 feet high. Branches of the panicle verticillate, with bracts at base. Flowers numerous. Petals 3, tinged with purple, roundish, deciduous, larger than the green, ovate, persistent sepals. July. *Water Plantain.*

2. SAGITTA'RIA.

Flowers monœcious; *sterile* with about 24 stamens; *fertile* with numerous ovaries aggregated, and becoming, in fruit, as many compressed, margined achenia collected into a globose head.

Lat. *sagitta*, an arrow; from the peculiar form of the leaf. Perennial, acaulescent. Lvs. radical, generally sagittate. Fls. in verticels of 3, the sterile ones near the summit of the scape, fertile below them.

1. S. SAGITTIFO'LIA.

Leaves lanceolate, acute, sagittate, lobes lanceolate, acute. A curious aquatic plant, conspicuous with its large white flowers among the rushes and sedges of sluggish waters. Root fleshy and farinaceous. Leaves 3—10 inches long including the lobes which are nearly half this length, $\frac{1}{2}$—4 or 5 inches wide, smooth and entire. Scape 1—2 feet high, branching, obtusely 3-angled. Flowers generally in 3s, the upper ones barren. Petals 3, large, roundish, white and very delicate. July. Aug. The leaves, &c., are exceedingly variable, and Dr. Torrey has appended the following, as varieties:

β. *latifolia*; *leaves* broad-ovate, rather obtuse, with straight, ovate, slightly acuminate lobes.

γ. *hastata*; *leaves* oblong-lanceolate, acute, with spreading, lanceolate, long, acuminate lobes; *flowers* mostly diœcious.

δ. *gracilis*; *leaves* linear, with linear, very long, acute and spreading lobes.

ε. *pubescens*; *plant* distinctly pubescent, in all its parts; *leaves* and their lobes ovate. *Arrow-head.*

2. S. RI'GIDA.

Leaves narrow-lanceolate, carinate, rigid, very acute at both ends; *scape* branching. N. York. Growing in water even to the depth of 7 feet, according to *Dr. Beck.* Leaves remarkably dissimilar to those of the foregoing species, 5—6 inches in length, one in width, thick and brittle, and on stout, rigid petioles, prolonged according to the depth of the water. Flowers numerous and large, with 3, white, rounded petals; fertile ones on short peduncles. July. *Brittle-leaved Sagittaria.*

3. S. HETEROPHY'LLA.

Leaves smooth, linear and lanceolate, acute at each end, rarely some of them elliptical and sagittate, with lobes linear and divaricate; *scape* simple, few-flowered, fertile flowers subsessile. Muddy shores. Leaves 2—4 inches long, $\frac{1}{2}$ as wide, on petioles rather longer than the scape which is seldom a foot high. Flowers few, the three lower ones fertile and very nearly sessile, all with roundish bracts at base. July.

4. S. ACUTIFO'LIA.

Leaves subulate, sheathed at base, convex on the back; *scape* simple, few-flowered; *bracts* broad, acuminate. Muddy shores. Mass. N. York. Leaves very small (1—2 inches long), thick and concave, on long, round, sheathing petioles. Scape simple, half a foot high. Flowers few, pedunculate, in

whorls of 3, as in other species. Barren flowers with 12—15 stamens. Petals roundish, white. Aug.

5. S. PUSI'LLA. *Nutt.* Alisma subulata.

Petioles (leaves?) short, linear, obtuse, summits only foliaceous; *scape* simple, shorter than the leaves; *flowers* few, fertile one solitary, deflexed; *stamens* mostly 7. A diminutive species on muddy banks. Leaves rarely subulate, an inch or two long, less than a line wide. Scape 2—4 inches high. Flowers 4—7, the lowest one only fertile. Aug.

SUBORDER. JUNCAGINEÆ.

Sepals and petals both herbaceous (green), or 0. Stamens 6. Ovaries 3 or 6, coherent, ovules 1—2 in each carpel. Seeds erect, with the embryo straight. Herbaceous, bog plants. Leaves ensiform. Flowers in spikes or racemes.

3. TRIGLO'CHIN.

Sepals and petals concave, deciduous, the former inserted a little below the latter; stamens 6, very short; anthers large, extrorse; ovaries 1-ovuled; stigmas adnate; fruit clavate, composed of 3—6 united, indehiscent, 1-seeded carpels.

Gr. τρις three, γλωχις, a corner; for the three-angled fruit. Root perennial. Leaves grass-like, all radical.

1. T. MARI'TIMUM.

Fruit ovate-oblong, grooved, of 6 united carpels; *scape* longer than the leaves. A rush-like plant in salt marshes and ditches on the sea-coast and at Salina, N. Y., &c. Leaves linear, semicylindric, smooth, thick, 6—12 inches long, less than a line wide. Scape obtusely angled, simple, 9—18 inches long, bearing a long raceme of 30—40 green flowers on pedicels 1—2 lines long. Fruit separating into 6 linear carpels, each containing a linear seed. The plant has a sweetish taste, and cattle are fond of it. Jl. *Sea Arrow-grass.*

2. T. PALU'STRE.

Fruit nearly linear, of 3 united carpels; *scape* scarcely longer than the leaves. In marshes, Salina, N. Y. Leaves very numerous, fleshy, smooth, very narrow. Scape 6—12 inches high, ending in a raceme with rather remote, very small, green flowers on pedicels 2—3 lines long. The slender fruit is attenuated at base, obtuse at apex, grooved and margined, consisting of 3 very slender carpels. July. *Marsh Arrow-grass.*

4. SCHEUCHZE'RIA.

Sepals and petals oblong, acute, persistent; stamens 6, with linear anthers; stigmas sessile, lateral; ovaries 1—2-ovuled; capsules inflated, compressed, 2-valved, 1—2-seeded.

In honor of the Scheuchzers, two brothers, distinguished botanists. Root perennial. Leaves cauline, linear, sheathing at base.

S. PALU'STRIS.

A rush-like plant, in swamps. Vt. N. York. Rootstock horizontal, fleshy. Stem about a foot high, simple, angular. Leaves semicylindric, 4—6 inches long, in the barren shoots much longer, sheathing at base. Raceme terminal, 5—8-flowered. Flowers yellowish green, on short pedicels, each axillary to a bract. Stamens large, exserted, erect. July. *Flowering Rush.*

ORDER CXLI. HYDROCHARIDACEÆ. *The Frog-bit Tribe.*

Fls.—Diœcious or perfect, issuing from a spathe.
Perianth.—Sepals 3, herbaceous. *Petals* 3, colored.
Sta.—Definite or indefinite, epigynous.
Ova.—Adherent to the perianth, single. *Stigmas* 3—6. *Ovules* indefinite.
Fr.—Dry or succulent, indehiscent, 1 or more-celled. *Seeds* without albumen.

A small order of floating plants. Leaves parallel-veined. Native of Europe, North America and the East Indies. Of no important use.

Genera.

Leaves short and verticillate. Flowers axillary, solitary. . . .	*Udora.*	1
Leaves long, linear, radical. Flowers elevated on long scapes. . . .	*Vallisneria.*	2

1. UDO'RA.

Flowers diœcious; spathe bifid; spadix 1-flowered. *Sterile.*—Stamens 9, 3 of them interior. *Fertile.*—Tube of the perianth very long; abortive filaments 3; capsule ventricose, 3-seeded.

Gr. ὕδωρ, water; from its aquatic habits. Creeping. Leaves verticillate.

U. CANADE'NSIS. *Nutt.* Elodea Canadensis. *Mx.* Serpicula verticillata. *Muh.*

Leaves verticillate, in 3s and 4s, lanceolate, oblong or linear, serrulate; *tube of the perianth* filiform. Resembling a coarse moss, in still waters. Stem filiform, diffusely dichotomous, very leafy, submersed. Leaves $\frac{1}{4}$—$\frac{1}{3}$ inch long, about $\frac{1}{2}$ line wide, thin and diaphanous, sessile, obtuse. Flowers axillary, solitary, minute, of a dingy white, the slender tube about as long as the leaves. Aug. *Ditch Moss.*

2. VALLISNE'RIA.

Flowers diœcious; spathe ovate, 2—4-parted. *Sterile.*—Spadix covered with minute flowers; corolla 0. *Fertile.*—Spathe bifid, 1-flowered; perianth elongated; sepals linear; stigmas 3, ovate, bifid; capsule 1-celled, many-seeded.

In honor of Anthony Vallisneri, a French botanist. Submersed, perennial. Lvs. all radical. Scape spiral, very long.

V. AMERICA'NA.

Leaves linear, obtuse, serrulate at the end, tapering at the base, floating; *peduncle of the fertile flower* long, *of the sterile* short, erect. A curious plant in slow moving or stagnant waters. Leaves linear, 1—2 feet long, about $\frac{1}{2}$ inch wide, the edges thinner than the middle. Scapes several, of the sterile plants short, of the fertile plants very tortuous, 2—4 feet long when extended, thread-like, thickened at top, bearing each a single, white flower at or near the surface. Sepals and petals crowning the (1 inch) long, narrow, incurved ovary which is half concealed in the spathe. Jl. Aug. *Tape Grass.*

ORDER CXLIII. ORCHIDACEÆ. *The Orchis Tribe.*

Fls.—Very irregular, with an adherent, ringent perianth of 6 parts.
Cal.—Sepals 3, usually colored, odd one uppermost by the twisting of the ovary.
Cor.—Petals 3, usually colored, odd one lowest by the twisting of the ovary.
Lip.—(*Labellum*, or lowest petal) diverse in form, often lobed, frequently spurred at base.
Sta.—3, united into a central *column*, the 2 lateral ones generally abortive, and the central one perfect; more rarely, the central abortive and lateral perfect.

Anth.—2, 4 or 8-celled, persistent or deciduous, often operculate.
Pol.—Either powdery, or cohering in waxy masses (*pollinia*), which are either constantly adhering to a gland, or becoming loose in their cells.
Ova.—1-celled, with 3 parietal placentæ. *Ovules* indefinite.
Sty.—Consolidated with the stamens. *Stig.* a viscid cavity in front of the column.
Fr.—Capsule 3-ribbed, 3-valved. *Sds.* many, without albumen.

An extensive order, embracing not less than 1500 species. They are among the most interesting and curious of plants, almost always remarkable for the grotesque form of their tortuous roots and stems, and the fragrance, brilliancy and odd structure of the flowers. They are all perennial herbs, often acaulescent, with fleshy corms, or tuberous, fasciculated roots. Leaves simple, parallel-veined, entire. Flowers in terminal, or radical racemes, spikes or panicles, rarely solitary.

The Orchidaceæ are natives of every part of the world. In the tropics multitudes of them are epiphytes, growing on living trees or decaying timber.

This order is remarkable for those qualities only, which please the eye. Many of its species are cultivated for ornament, but few of them possess either active or useful properties. The *salep* of commerce is a nutritive, mucilaginous substance afforded by the roots of some Asiatic Orchis. The aromatic *vanilla*, used to flavor chocolate, &c., is the fruit of the West Indian Vanilla claviculata.

Conspectus of the Genera.

				cauline.	*Microstylis.*	1
		Leaf solitary,	ovate, ensiform (rarely 2).	radical.	*Aplectrum.*	4
					Calopogon.	11
		Leaves 2 only,	near base of stem.		*Liparis.*	2
			near middle of stem.		*Listera.*	14
	Flowers several.	Leaves several,	radical.	ringent.	*Goodyera.*	13
			Sepals	erect.	*Spiranthes.*	12
			cauline. Fls. 3 or 4.		*Triphora.*	10
Leaves 1 or more.	Spur 0. . . .	Flower solitary, lip bearded within.			*Pogonia.*	9
	Fertile anth. 1.	Lip spurred at base, flattish.	Pollinia 2. Fls. bracteate.		*Orchis.*	7
			Pollinia 4. Fls. bractless.		*Tipularia.*	6
			ventricose. Flower and leaf solitary.		*Calypso.*	5
	Anthers 2 fertile, middle one sterile, petaloid. Lip saccate.				*Cypripedium.*	15
	Plants green. Flowers solitary. Lip bearded within.				*Arethusa.*	8
Leaves 0.	Plants destitute of green herbage. Flowers racemose.				*Corallorhiza.*	3

§ *Pollen cohering in grains which finally become waxy, and are definite in number.*

1. MICRO'STYLIS.

Segments of the perianth distinct, petals filiform; lip sessile, concave, erect, truncate and bidentate at summit; column minute; pollinia 4, loose.

Gr. μικρος, little, στυλος, style; alluding to the slender column.

1. M. ORPHIOGLOSSOI'DES. *Nutt.* Malaxis orph. *Willd.* M. unifolia. *Mx.*

Leaf solitary, ovate, amplexicaul; *stem* 5-angled; *raceme* short, obtuse, capitate; *pedicels* much longer than the flowers. A small plant, in swamps, &c. Stem 5—9 inches high, with a single leaf a little below the middle. This leaf is rather acute, smooth, ovate or oval, about 2½ inches in length, 1 in width. At the base of the stem, is an abrupt sheath. Flowers whitish, minute, numerous, in a terminal raceme an inch or more in length, dense at top. Bracts minute. Pedicels about 4 lines long. June.

2. M. BRACHY'PODA. *Gray.* M. monophyllus. *Willd.*

Leaf solitary; *raceme* subspicate, slender, elongated; *flowers* as long as the pedicels; *lateral petals* refracted; *lip* triangular-hastate, cucullate, acuminate. N. York. July.

2. LIPA'RIS.

Segments of the perianth distinct, sublinear, spreading or deflexed; lip spreading, flat, ascending, often exterior; col-

umn winged; pollinia 4, parallel with each other, without pedicels or glands.

Gr. λιπαρος, elegant, shining; a term characteristic of these plants.

1. L. LILIFO'LIA. *Rich.* Malaxis lilifolia. *Sw.*

Leaves 2, ovate-lanceolate; *scape* triangular; *inner petals* filiform, reflexed; *lip* concave, obovate, acute at the tip. Leaves radical, 3—6 inches long, $\frac{1}{3}$—$\frac{1}{2}$ as wide, rather acute, tapering into a sheathing base. Scape about 6 inches high. Flowers 10—20, in a terminal, rather showy raceme. Pedicels near an inch in length. The 3 sepals greenish-white, linear. 2 upper petals capillary, yellowish white. Lip much larger than the other petals, white. In woods and swamps. June. *Tway-blade.*

2. L. LŒSE'LII. *Rich.* L. Correana. *Spr.* Malaxis Lœselii. *Sw.*

Leaves 2, ovate-oblong, obtuse, plicate, shorter than the few-flowered racemes; *scape* angular; *lip* ovate, entire; *sepals and petals* linear, subequal. About half as large as the preceding, in moist meadows and fields. Leaves 2—3 inches long, about 1 wide, obtuse or acute, sheathing at base. Scape 3—5 inches high. Flowers about 6, appressed to the rachis, in a thin raceme. Pedicels about 2 lines in length. Sepals and petals greenish white. Ovaries clavate, as long as the pedicels. June.

3. CORALLORHI'ZA.

Segments of the perianth nearly equal, converging; lip produced behind; spur short and adnate to the ovary; column free; pollinia 4, oblique (not parallel).

Gr. κοραλλιον, coral, ῥίζα, a root; on account of its branched roots which much resemble coral. Plants leafless. Scape sheathed.

1. C. ODONTORHI'ZA. *Nutt.* C. innata. *Br.*

Lip undivided, oval, obtuse, crenulate, spotted; *spur* obsolete, adnate to the ovary; *capsule* subglobose. A singular plant, with no leaves or green herbage, inhabiting old woods. The root is a collection of small, fleshy tubes articulated and branched much like coral. Scape 9—14 inches high, rather fleshy, striate, smooth, invested with a few, long, purplish brown sheaths. Flowers 15—25, in a long spike, of a brownish green. Lip white, generally with purple spots. Capsules large, reflexed, strongly ribbed. July, Aug.

β. (C. innata. *Nutt.*); *lip* white, without spots. More delicate and slender than the variety *α*. Flowers fewer (7—10). *Dragon's-claw. Coral-root.*

2. C. MULTIFLO'RA. *Nutt.*

Scape many-flowered; *lip* cuneate-oval, spotted, 3-parted, the middle lobe recurved, lateral ones short and tooth-like; *spur* conspicuous, adnate; *capsule* elliptic-obovoid. In woods, growing on the roots of trees. N. H. Common. Root coralline. Scape 10—15 inches high, leafless, brownish purple, sheathed with a few bracts. Flowers larger than in the other species, 15—20, erect, spreading, on a long raceme. Lip showy, 3—4 lines long, white, sprinkled with purple spots. Spur yellowish, conspicuous, but short and adnate to the ovary. July. *Flowering Coral-root.*

4. APLE'CTRUM.

Segments of the perianth distinct, nearly equal, converging; lip unguiculate, not produced at base; column free; anther a little below the apex; pollinia 4, oblique, lenticular.

Gr. α, privative, πληκτρον, a spur; the lip being without a spur.

A. HYE'MALE. *Nutt.* Cymbidium hyemale.

Leaf solitary, radical, petiolate, ovate, striate; *lip* trifid, obtuse, with the palate ridged. A fine plant, in woods. Root bearing large, roundish, mucilaginous tubers. Leaf rather elliptic than ovate, 4—5 inches long, $\frac{1}{3}$—$\frac{1}{2}$ as wide, twice as long as the petiole which arises from the summit of the tuber a short distance from the scape. Scape arising from beneath the tuber, about a foot high, invested with 2—3 sheaths. Flowers resembling those of Corallorhiza, brownish purple, erect, in a terminal raceme. Lip dilated near the end. Caps. large, smooth, nodding. My., Jn. *Adam-and-Eve. Putty-root.*

5. CALY'PSO.

Segments of the perianth ascending, secund; lip ventricose, spurred beneath near the end; column petaloid; pollinia 4.

Named for the goddess Calypso (Gr. καλύπτω, to conceal).

C. BULBO'SA. *Salisb.* C. Americana *Br.* C. borealis. *P.* Cypripedium. *L.*

Leaf solitary, radical, broad-ovate, nerved; *lip* narrowed and subunguiculate at base; *spur* bifid, longer than the lip, with acute teeth; *peduncle* longer than the ovary. This rare and beautiful plant is found in Vt., and is said to be also in the northern part of N. H. Scape 6—8 inches high, sheathed, bearing a single, purplish flower at top, as large as that of a Cypripedium. Leaf petiolate, 2—3 inches in diameter, subcordate at base.

6. TIPULA'RIA.

Segments of the perianth spathulate, spreading; lip entire, sessile, conspicuously spurred at base; column wingless, free; anther operculate, persistent; pollinia 4, parallel.

Tipula, the crane-fly; from the fancied resemblance of the flowers.

T. DI'SCOLOR. *Nutt.* Orchis. *P.* Limodorum unifolium. *Muh.*

A slender, green-flowered plant, resembling a Corallorhiza, growing in pine woods, Vt. Root bulbous. Leaf solitary, petiolate, ovate, plaited, smooth, and longitudinally nerved. Flowers minute, greenish white, nodding, in a terminal raceme destitute of bracts. July.

§ § *Pollen cohering in waxy masses, which are pedicellate, with glands at the base of the pedicels. Anthers of 2 distinct, vertical cells.*

7. ORCHIS.

Perianth ringent, the upper sepal vaulted; lip entire or lobed, produced at base into a spur which is distinct from the ovary; anther terminal; pollinia 2, adnate, pedicellate.

The Greek name of these plants. Flowers racemose or spicate.

* Lip broad, entire. Glands of the pedicels of the pollinia enclosed. ORCHIS *vera.*

1. O. SPECTA'BILIS.

Leaves about 2, nearly as long as the scape; *lip* obovate, undivided, crenate, retuse; *segments of the perianth* straight, the lateral ones longer; *spur* clavate, shorter than the ovary, *bracts* longer than the flower. This pretty little plant is found in shady woods and thickets, among rocks, &c. Root fasciculate.

Leaves few, radical, ovate, 3—6 inches long, $\frac{1}{3}$—$\frac{1}{2}$ as wide. Scape 4—6 inches high, acutely-angled, with a lanceolate, acute bract and 3—5 large, showy flowers. Segments of the perianth purple, ovate-lanceolate. Lip and spur white or whitish, each about 8 lines long. May, Jn. *Showy Orchis.*

* * Lip narrow, entire. Cells of the anther widely separated at base by the broad, interposed stigma. Glands of the pedicels of the pollinia naked. PLATANTHERA.

2. O. ORBICULA'TA. *P.* Platanthera. *Lindl.*

Leaves 2, radical, suborbicular, rather fleshy; *scape* bracteate; *upper sepals* orbicular, *lateral ones* ovate; *lip* linear-subspathulate, nearly twice as long as the sepals; *spur* arcuate, compressed, clavate, twice as long as the ovary. A remarkable plant, not uncommon in old woods and in thickets, N. H., Vt., &c. Leaves lying flat upon the ground, 3—6 inches in diameter, rather inclining to oval or ovate with the apex acute. Scape 1—2 feet high, sheathed with a few bracts, bearing a raceme of numerous, greenish white flowers. Lip $\frac{3}{4}$—1 inch long, $\frac{1}{2}$—1 line wide. Spur $1\frac{1}{2}$—2 inches long. July.

3. O. HOO'KERI. *Torr.* Platanthera. *Lindl.*

Leaves 2, radical, suborbicular, fleshy; *scape* naked; *upper sepal* ovate, *lateral ones* lanceolate, reflexed; *lip* lanceolate, acuminate, a little longer than sepals; *spur* subulate, arcuate, twice as long as the ovary. Woods. Very nearly allied to the former species. Leaves more fleshy and frequently perfectly orbicular, 3—4 inches in diameter. Scape generally without a bract and perfectly smooth, 10—15 inches high. Flowers numerous, in a close, straight raceme, greenish white, more slender in all their parts. June.

4. O. HYPERBO'REA. *L.* O. dilatata & Huronensis. *Spreng.* Platanthera. *Lindl.*

Stem leafy; *leaves* very erect, acute; *spike* somewhat secund; *bracts* linear-lanceolate, acute, longer than the flower; *sepals* deflexed; *petals* and *lip* linear, obtuse, subequal, and about as long as the pendulous, obtuse spur. A tall, leafy, variable species, found in mountainous woods and open meadows. Stems thick, 2 or 3, or even 4 feet high. Leaves lanceolate, 4—7 inches long, $\frac{1}{2}$—$1\frac{1}{2}$ inch wide. Flowers greenish in shades, nearly white in open situations, forming a long, more or less dense spike. July. *Giant Orchis.*

β. *leaves* lanceolate and linear-lanceolate; *spikes* long, cylindric; *bracts* as long as the flowers; *lip* linear-lanceolate, obtuse.

γ. *lower leaves* more dilated, *upper ones* grass-like; *spike* loose, slender; *lip* ovate-lanceolate, the length of the incurved spur.

5. O. OBTUSA'TA. *P.* Habenaria. *Rich.* Platanthera. *Lindl.*

Leaf solitary, oblong-obovate, obtuse; *stem* bearing the leaf near its base; *spike* loose; *upper sepal* broadest; *petals* subtriangular; *lip* linear, entire, with 2 tubercles at base, as long as the arcuate, acute spur. Found in muddy ponds and ditches. N. H. Stem slender, angular, 6—8 inches high, terminating in a thin spike of about a dozen small, greenish white flowers. Leaf tapering at base, and usually obtuse at the summit, 2—3 inches in length and 1 in breadth, issuing with the stem from 2—3 radical, sheathing bracts. Jl.

* * * Lip dilated, variously divided. Glands of the pedicels of the pollinia naked, distinct. HABENARIA. † Lip toothed or 3-parted, not fimbriate.

6. O. FLAVA. *L.* O. herbiola. *Br.* Habenaria. *Rich.* Platanthera. *Lindl.*

Stem leafy; *lower leaves* oblong, acute, *upper* lanceolate, acuminate; *spike* rather dense, cylindric; *bracts* longer than the flowers; *lip* oblong, obtuse, dentate at base; *palate* with 1 tuberculate tooth; *spur* filiform, rather shorter than the sessile ovary. A small-flowered orchis found in alluvial soil. Stem flexuous, 12—18 inches high. Leaves about 3, with long sheaths, 3—6 or 7 inches long, $\frac{3}{4}$—2 inches wide, tapering to an acute summit. Flowers in a

long, thin spike. Sepals short, ovate, green. Petals yellowish. Upper bracts about as long as the flowers, lower ones 2 or 3 times as long. The tubercle of the lip is a remarkable character. June. *Field Orchis.*

7. O. VIR'IDIS. *Swtz.* O. bracteata. *Muh.* Peristylus bracteatus. *Lindl.*

Stem leafy; *leaves* oblong, obtuse, upper ones acute; *spike* lax; *bracts* 2—3 times as long as the flowers; *sepals* connivent, ovate; *petals* linear, erect; *lip* linear-cuneate, truncate, 3-toothed at the end, the middle tooth small or obsolete; *spur* short, inflated, obtuse. A small, green flowered orchis, in shades. Stem 6—9 inches high. Leaves about 3, 1½—2½ inches long, ½—1 inch wide, upper bracts as short as the flower. Spike 2—3 inches long. Flowers yellowish green. Lip as long as the ovary, 3 times as long as the spur. Jl, Aug.

8. O. TRIDENTA'TA. *Willd.* Habenaria. *Hook.* Gymnadenia. *Lindl.*

Radical leaf solitary, oblong, obtuse, *cauline* 2—3, much smaller; *sepals* campanulate, obtuse, converging; *lip* lanceolate, 3-toothed, at the extremity; *spur* filiform, curved, clavate, longer than the ovary. Grows in woods and swamps. Stem slender, 1—2 feet high, with small, greenish white flowers in a short and rather loose spike, appearing in July. *Three-toothed Orchis.*

9. O. ROTUNDIFO'LIA. Habenaria. *Rich.* Platanthera. *Lindl.*

Leaf solitary, roundish-ovate; *scape* naked; *spike* few-flowered; *bracts* obtuse, shorter than the ovary; *sepals* and *petals* obtuse; *lip* 3-lobed, lateral, lobes subfalcate, middle one obcordate; *spur* as long as the lip. Scape about a foot high, slender, without a bract. Leaf 2—4 inches long, ¾ as wide, spotted, sheathing at base. Flowers about a dozen, of a greenish white, remarkable for their broad, 3 (almost 4)-lobed, pendant lip.

† † Lip fimbriate. Stem leafy.

10. O. CILIA'RIS. *L.* Habenaria. *Rich.* Platanthera. *Lindl.*

Lower leaves linear-lanceolate; *spike* oblong, dense; *bracts* shorter than the ovary; *lip* oblong-lanceolate, pinnate-ciliate, twice as long as the petals; *spur* longer than the ovary. A delicately beautiful orchis, with bright orange-colored flowers, in swamps, rare. Stem about 2 feet high. Leaves sheathing at base; lower ones 3—5 inches long, rapidly diminishing upwards. Sepals roundish, obtuse, concave. 2 petals linear, very small, incised at the summit; the lip narrow, lanceolate, conspicuously fringed, 4 lines long. Spur an inch long. July, Aug. *Fringed Yellow Orchis.*

11. O. BLEPHARIGLO'TTIS. *Willd.* Habenaria. *Rich.* Platanthera. *Lindl.*

Lower leaves lanceolate, channeled; *spike* oblong, dense; *bracts* linear, acuminate, shorter than the flowers; *lip* lanceolate, ciliate, as long as the upper sepal; *spur* much longer than the long-beaked ovary. A delicate orchis, in swamps, resembling the last species, but distinguished at least, by the color of its flowers which are of a pure white. Stem 1—2 feet high. Fls. fewer than in the last. Sep. roundish oblong, lateral reflexed. Pet. spathulate, dentate. Lip fringed in the middle, 2 lines long. Jn. Jl. *Fringed White Orchis.*

12. O. LA'CERA. *Mr.* O. psycodes. *Spreng.* Habenaria. *Br.* Platanthera. *Lindl.*

Lower leaves oblong, obtuse, *upper ones* narrow, acuminate; *bracts* longer than the flowers; *sepals* retuse; *petals* emarginate; *lip* 3-parted; *segments* cuneate, capillaceous-multifid; *spur* filiform, clavate, as long as the ovary. Swamps and meadows. Stem 1—2 feet high, smooth, slender. Leaves few, 3—6 inches long, ½—1 inch wide, mostly acute. Flowers numerous, in a long, loose spike, of a greenish white, not showy. Sepals ovate. Petals oblong-linear, entire, lip reflexed, very deeply lasciniate. Readily distin-

guished from the following by its more slender habit, greenish flowers, and the entire (not fringed) petals. July. *Ragged Orchis.*

13. O. PSYCODES. *L.* O. fimbriata. *Br.* Habenaria. *Rich.* Platanthera. *Lindl.*

Lower leaves lanceolate, diminishing upwards; *lip* 3-parted, scarcely longer than the petals, the segments cuneiform, ciliate-fimbriate; *lateral petals* ovate, fimbriate-dentate; *spur* filiform, clavate, longer than the ovary. A beautiful plant, very common in meadows, &c. Stem 1½—2½ feet high, smooth, slender. Leaves 3—6 inches long. Flowers showy, numerous, in a terminal, cylindric spike, light-purple. Lip of the nectary somewhat longer than the petals, its 3, fan-like, spreading segments, as well as the petals, beautifully fringed. Spur an inch in length. July. *Fringed Purple Orchis.*

14. O. GRANDIFLO'RA. *Bw.* Habenaria. *Torr.* Platanthera fimbriata. *Lindl.*

Lower leaves oblong, oval, obtuse, *upper ones* very narrow; *bracts* shorter than the ovary; *raceme* oblong; *lip* dependent, twice as long as the petals, 3 parted, the segments cuneiform and fimbriate, the middle one largest, with connivent fimbriæ; *lateral petals* fimbriate; *spur* ascending, clavate, longer than the ovary. A superb plant, considered the most beautiful of the genus, in wet meadows, &c. Stem 2—3 feet high, thick, hollow, with several sheathing bracts at base. Leaves 2 or 3 principal ones, 4—7 inches long, 1—2 wide, upper ones linear, an inch or two long. Flowers very large purple, in a terminal raceme 3—6 inches long. Middle seg. of the lip, nearly semicircular, twice as long as the lateral ones. Jn. *Large-flowering Orchis.*

§ § § *Pollen powdery, or consisting of loosely cohering granules.*

8. ARETHU'SA.

Perianth with its segments cohering at base; lip spurless, adnate to the column at base, deflected at the end and bearded inside; pollen angular.

Arethusa was a fabulous nymph of Diana, who was transformed into a fountain. These fine little plants are inhabitants of wet places.

A. BULBO'SA.

Leafless; *root* producing a globular tuber; *scape* sheathed, 1-flowered. This beautiful and interesting plant is found only in wet meadows and swamps. Stem 6—12 inches high, invested with about 3, long, loose sheaths with lanceolate points, the upper ones rarely at length produced into a short, linear-spathulate leaf. At the top is a single, large, fragrant flower of a rich purple color. A little below the base of the flower is a small spathe of 2 unequal bracts. June. *Bulbous Arethusa.*

9. POGO'NIA.

Perianth with its segment distinct; lip sessile, cucullate, bearded inside; pollen farinaceous.

Gr. πωγων, beard; in allusion to the bearded lip.

1. P. ORPHIOGLOSSOI'DES. Arethusa. *L.*

Root fibrous; *stem* furnished with an oval-lanceolate leaf and a foliaceous bract near the flower; *lip* fimbriate. An interesting plant, much taller than the bulbous Arethusa, found in swamps and muddy shores. The stem is very slender, 9—16 inches high, with 2 remote leaves, the one placed about midway, 2—3 inches long, lanceolate, acute, sheathing at the base; the other (a bract?) much smaller, situated near the flower. Flower large, nodding, pale purple. Lip long as petals and sepals (¾ inch). Jn. *Adder's-tongue Arethusa.*

2. P. VERTICILLA'TA. *Br.* Arethusa. *Willd.*

Leaves 5, oblong-lanceolate, verticillate; *flower* solitary, the 3 outer petals very long, linear, inner ones shorter, lanceolate, obtuse; *lip* 3-lobed, the middle lobe undulate. Swamps. Stem 8—12 inches high, with a whorl of leaves near the top and a flower 1—2 inches above it. Leaves $1\frac{1}{2}$ inch long, $\frac{1}{2}$ as wide, abruptly acuminate. The flower is remarkable for its sepals being about 2 inches long, very narrow, and of a greenish brown color. Lip crested in the middle. July. *Whorled Pogonia.*

10. TRI'PHORA.

Segments of the perianth distinct, equal and converging; lip nearly beardless, unguiculate; column spathulate, even, flattened, wingless; pollen farinaceous.

Named in reference to its usual number of flowers.

T. PE'NDULA. *Nutt.* Pogonia. *Lindl.*

Root tuberous; *stem* leafy, about 3-flowered at the top; *leaves* clasping, ovate, alternate; *flowers* axillary, nodding; *lip* entire, scabrous, not bearded; *fruit* pendulous. A small, delicate plant, in swamps, &c. Stem scarcely 6 inches high, slightly angled, with about 3 flowers, which from their singular form, suggest the common name. Leaves 3—6, $\frac{1}{3}$—$\frac{2}{3}$ inch long, $\frac{2}{3}$ as wide, purplish. Flowers white or greenish, the segments of the perianth equal, converging, and rather longer than the lip. Aug. *Three-birds.*

11. CALOPO'GON.

Segments of the perianth distinct; lip on the upper side of the flowers, unguiculate, bearded; column free, winged at the summit; pollen angular.

Gr. καλος, beautiful, πωγων, beard; in allusion to the bearded lip.

C. PULCHE'LLUM. *Br.* Cymbidium pulchellum. *P.*

Root tuberous; *leaf* radical, ensiform, nerved; *scape* few-flowered; *lip* erect, narrowed at base, with an expanded border, and a concave, hairy disk. A truly beautiful plant, in swamps. Scape slender, 10—20 inches high, furnished with a single, long leaf (8—12 inches long, $\frac{1}{2}$ inch wide), sheathing its base. Flowers 3—8, large, purple, remarkable for their inverted position; lip expanded at the end and fimbriate, on the upper side of the flower, while the column is below. Petals and sepals expanded. Jl. *Grass-Pink.*

12. SPIRA'NTHES.

Flowers in a spiral spike; petals connivent; lip unguiculate, parallel with the column, entire, with 2 callous processes at base; column free, clavate, bidentate at summit; ovary oblique; stigma rostrate.

Gr. σπειρα, a cord; in reference to the twisted spike.

1. S. GRA'CILIS. *Beck.* Neottia. *Bw.*

Leaves radical, ovate, caducous; *scape* sheathed; *flowers* in a spiral row; *lip* obovate, curled. A very delicate plant, not uncommon in old woods. Scape leafless, with several remote, sheathing scales, very slender, and 8—12 inches high. Leaves 3—4, close to the ground, 1—2 inches long, $\frac{1}{3}$ as wide,

on short petioles, mostly withering and falling away before the flowers expand. Flowers small, white, arranged in a row which winds once or twice around the stem. July. *Ladies' Tresses.*

2. S. ÆSTIVA'LIS. *Rich.* Ophrys. *Mx.* S. tortilis. *Swtz.*

Radical leaves linear; *scape* sheathed; *flowers* spirally secund; *lip* somewhat 3-lobed, the middle lobe larger, crenulate. A plant mostly similar to the last, in woods and meadows. Leaves 3—6 inches long, 2—4 lines wide, commonly disappearing before flowering. Scape slender, a foot or more high, with a spiral row of oblique, small, white flowers, forming a twisted spike 2—4 inches long. July. *Summer Ladies' Tresses.*

3. S. CE'RNUA. *Rich.* Neottia. *Willd.*

Leaves radical, linear-lanceolate, nerved; *stem* sheathed; *spike* dense; *flowers* recurved, drooping; *sepals* and *petals* cohering; *lip* oblong, entire or crenulate, dilated at the apex. In moist grounds. Scape $\frac{1}{2}$—$1\frac{1}{4}$ foot high, rather stout, pubescent above, with a dense, twisted spike at summit 1—2 inches long. Leaves 3 or more, nearly or quite radical, 3—8 or 10 inches long, $\frac{1}{3}$—1 inch wide. Bracts ovate, acuminate, as long as the greenish flowers. Aug.—Oct. *Nodding Ladies' Tresses.*

13. GOODYE'RA.

Perianth ringent; calyx herbaceous, upper sepal vaulted, the 2 lower ones beneath the saccate and entire lip; column free, pollen angular; stigma prominent, roundish.

Named for John Goodyer, an obscure English botanist.

G. PUBE'SCENS.

Leaves radical, ovate, petiolate, reticulate; *scape* sheathed, and, with the flowers pubescent; *lip* ovate, acuminate; *petals* ovate. A plant found in woods, remarkably distinguished for its leaves which are all radical and of a dark green, reticulated above with white veins. They are ovate, 1—2 inches in length, contracted at base into winged petioles scarcely half as long. Scape erect, 6—12 inches high. Flowers white, in a terminal, oblong, cylindric spike. Lip roundish, saccate, inflated. Jl., Aug. *Rattle-snake Plantain.*

β. repens (G. repens. *Br.*); *leaves* less conspicuously reticulated; *spike* somewhat unilateral. A reduced form of G. pubescens, certainly unworthy of being exalted into a species. Stem 6—8 inches high. Flowers in one row which is more or less spiral.

14. LI'STERA.

Lip 2-lobed, pendent, with no callous processes; column wingless, minute; anther fixed by its base, persistent.

Named for Dr. Martin Lister, an English naturalist, died 1711.

L. CORDA'TA. *Br.* Epipactis. *Swtz.*

Stem 2-leaved, the leaves opposite, deltoid-subcordate, acute; *raceme* few-flowered; *lip* linear, 2-toothed at base, deeply bifid, with divaricate and acute segments; *column* very short. Root fibrous. Stem 4—8 inches high, furrowed. Leaves $\frac{1}{2}$—$\frac{3}{4}$ inch in diameter, sessile, about half way up the stem. Flowers minute, greenish purple, 10—15, in a short raceme. A delicate little plant, in woods and sphagnous swamps, among mountains, &c. July. Aug. *Lily Orchis.*

2. L. CONVALLARIOI'DES. *Nutt.* Epipactis. *Swtz.*

Stem 2-leaved, the leaves opposite, roundish-ovate; *raceme* few-flowered, loose, pubescent; *sepals* ovate-lanceolate; *lip* oblong, 2-toothed at base, with 2 roundish lobes and an intermediate minute one at the apex; *column* elongated. Root fibrous. Stem very slender, 5—10 inches high, sheathed with a few bracts bearing the 2 leaves near the middle. Leaves near an inch long, $\frac{2}{3}$ as wide. Flowers small, the broad, obcordate lip twice as long as the sepals. May.

§ § § § *Lateral anthers fertile; the middle one sterile and petaloid.*

15. CYPRIPE'DIUM.

The 2 lower sepals united into 1 segment, or rarely, distinct; lip ventricose, inflated, saccate, obtuse; column terminated by a petaloid lobe (barren stamen).

Gr. Κυπρις, Venus, ποδιον, a slipper; from the slipper-like form of the lip. Flowers large, very showy, distinguished for the large, inflated lower petal or lip.

1. C. ACAU'LE. *Ait.* C. humile. *Swtz.*

Scape leafless, 1-flowered; *leaves* 2, radical, elliptic-oblong, rather acute; *lobe of the column* roundish-rhomboidal, acuminate, deflexed; *petals* lanceolate; *lip* longer than the petals, cleft before. A beautiful plant, in dark woods. Leaves large, plaited and downy. Scape 10—14 inches high, with a single lanceolate bract at the base of the large, solitary flower. Sepals $1\frac{1}{2}$ inch long, the two lower completely united into a broad lanceolate one beneath the lip. Petals lateral, wavy. Lip 2 inches long, 1 wide, purple, forming the most showy part of the flower. May, June. *Acaulescent Ladies'-Slipper.*

2. C. PARVIFLO'RUM. *Willd.* C. pubescens. *Swtz.*

Stem leafy; *leaves* broad-lanceolate, acuminate; *lobe of the column* triangular-oblong, acute; *sepals* ovate, oblong, acuminate; *petals* long, linear, contorted; *lip* shorter than the petals, compressed. Woods and meadows. Stems usually several from the same root, about a foot high. Leaves 3—6 inches long, 2—3 wide, nerved, alternate, clasping, pubescent. Flower mostly solitary. Segments 4, greenish, with purple stripes and spots, the lower one bifid, composed of 2 united sepals, the 2 lateral ones 2—3 inches long, $\frac{1}{4}$ inch wide, waved and twisted. Lip a large, inflated sac, bright yellow, spotted inside, with a roundish aperture above. May, June. *Yellow Ladies'-Slipper.*

β. pubescens; leaves lanceolate; *lobe of the column* obtuse. The flowers somewhat smaller. Meriden, N. H.

3. C. SPECTA'BILE.

Stem leafy; *leaves* ovate-lanceolate, acuminate; *lobe of the column* elliptic-cordate, obtuse; *sepals* broad-ovate, obtuse; *lip* longer than the petals, cleft before. A tall, superb species found in swamps. Lebanon, N. H. Stem thick, 2 feet or more high, hairy. Leaves 6—10 inches long, 2—4 wide, nerved, plaited, hairy. Flowers 2—3 on each plant, very large. Lip white, striped with purple, 2 inches long, $1\frac{1}{2}$ broad; upper segment largest, lower one smaller, composed of 2 sepals completely united. Jl. *Tall Ladies'-Slipper.*

4. C. ARIETI'NUM. *Ait.* Arietinum Americanum. *Beck.*

Stem leafy; *leaves* elliptical, striate-nerved; *sepals* 3, distinct (the 2 lower not united), linear-lanceolate, the upper oblong-ovate, acuminate; 2 *lateral petals* linear; *lip* as long as the petal, saccate, obconic. In damp woods, Me. On Ascutney Mt., Vt. *Dr. Phelps.* Stems usually clustered, flexuous, 8—12

inches high, lower part sheathed. Leaves 3—5, 2—3 inches long, ½—1 inch wide, sessile, amplexicaul. Flower mostly solitary, with a leafy bract at base. Segments about equal in length, the upper one as broad as the other 4 together. The singular form of the lip readily suggests the name of this curious plant. May. *Ram's-head.*

ORDER CXLVIII. AMARYLLIDACEÆ. *The Narcissus Tribe.*

Perianth mostly regular, adherent to the ovary, colored, consisting of 3 sepals and 3 petals. *Sta.*—6, arising from the perianth segments. *Anthers* introrse.
Ova.—3-celled, the cells many-ovuled (sometimes 1—2-ovuled). *Style* 1. *Stig.* 3-lobed.
Fr.—A 3-celled capsule or berry. *Seeds* with fleshy albumen.

Perennial herbs, generally with bulbous stems. Leaves parallel-veined. Flowers showy, almost always either yellow or white, often on scapes and with spathaceous bracts. Chiefly tropical plants, most abundant in Brazil and S. Africa. Very few are found in our climate.

Properties. A few of the Amaryllidaceæ possesses poisonous properties, which is very rare among the Endogens. The Hottentots are said to poison their arrows by dipping them in the viscid juice of the bulbs of Hæmanthus toxicarius. The bulbs of Narcissus poeticus, and other species, are emetic. The fermented juice of the Agave forms the intoxicating *palque* of the Mexicans. Many are highly ornamental and are therefore cultivated.

Conspectus of the Genera.

Flowers regular.	Corona 0. Scape bearing 3—5 small, yellow flowers.	*Hypoxis.*	4
	Corona of 3 emarginate segments.	*Galanthus.*	3
	Corona monophyllous.	*Narcissus.*	2
Flowers irregular.	Stamens declined.	*Amaryllis.*	1

1. AMARY'LLIS.

Perianth irregular, funnel-shaped, nodding; filaments declined, arising from the orifice, unequal in proportion or direction; seeds flat, numerous.

Lat. *Amaryllis* the name of a Nymph celebrated by Virgil and other poets; derived from Gr. αμαρυσσω, to shine with splendor. A splendid genus, with a few native and many foreign species. They are easily cultivated from offsets or the seed. A shell taken from the bulb with the leaf on it, and planted in a pot of mould, will produce a bulb, as will almost any bulbous plant. *Sweet.*

1. A. FORMOSI'SSIMA.—*Lvs.* radical; *flowers* nodding, very ringent, tube fringed; *stamens* included in the involute lower segments. A splendid flower, from Mexico, often grown with us in large pots of light, loamy soil. Root bulbous. Leaves thick, oblong, narrow. Scape a foot high. Spathe red, disclosing a single large flower of a fine dark red color. Jn.—Aug. *Jacobea Lily.*

2. A. ATAMA'SCO.—*Spathe* 2-cleft, acute; *flower* pedicelled; *corolla* campanulate, with nearly equal petals, suberect. A pretty species found in Penn., south to Carolina, sometimes cultivated. Leaves linear, a foot long. Scape round, 6 inches high. Spathe a little colored, bifid at the summit. Flower large, solitary, white and pink. Sepals acuminate. Jn. *Atamasco Lily.*

2. NARCI'SSUS.

Perianth regular; corona monophyllous, funnel-form, consisting of a whorl of united sterile stamens, within which the fertile ones are inserted.

Gr. ναρκη, stupor; from the effects produced by the smell of some of the species, which are poisonous. A well known, popular genus, whose species are easily cultivated, many of them, very fragrant and beautiful. They have bulbous roots, ensiform leaves, and usually yellow flowers, with a long, compressed spathe, opening on one side, and deciduous.

1. N. JONQUI'LLA.—*Scape* 1—3-flowered; *segments* reflexed, spathulate; *cup* (corona) much shorter than the segments, saucer-shaped, spreading, crenate. Native of Spain. Scape a foot high, round, slender, bearing at the summit a few flowers of a rich yellow, and very fragrant. May, Jn. *Jonquil.*

2. N. POE'TICUS.—*Scape* 1-flowered; *segments* imbricate at base, reflexed; *corona* expanded, flat, rotate, crenulate; 3 *anthers* shorter than the tube. Native of S. Europe. Scape about a foot high, leaves of the same length. It bears a single flower, which is mostly white, but having the crown singularly adorned with circles of crimson, white and yellow. Jn. *Poet's Narcissus.*

3. N. PSEUDO-NARCI'SSUS.—*Scape* 2-edged, straight, striated; *segments* sulphur color; *corona* with a serrate-crenate orifice. Native of England. Root bulbous. Leaves linear, a foot long, striate, ribbed. Scape a foot high, bearing at the top a single, very large flower, with a very long cup or corona. April. May. *Daffodil.*

4. N. TAZE'TTA.—*Spathe* many-flowered; *corona* campanulate, truncate, shorter than the petals; *leaves* flat. Native of Spain. Root a large bulb. Leaves smooth, sword-shaped. Scape naked, striate, a foot high, with 10—12 flowers. Corolla white, cup a strong yellow, not fragrant. April. May. *Polyanthus.*

3. GALA'NTHUS.

Flowers spathaceous; sepals 3, concave; corona formed of 3 small, emarginate segments; stigma simple.

Gr. γαλα, milk, ανθος; on account of the delicate whiteness of the flower. Ornamental, bulbous exotics.

G. NIVA'LIS.—*Leaves* linear, radical, keeled, acute; *scape* 1-flowered. Native of the Alps, well known in gardens, flowering early in Spring. It is a small plant, half a foot high, arising from a perennial bulb, bearing a single, large, nodding flower white as snow. Stem usually furnished with 2 long, narrow leaves towards the top. *Snow-drop.*

4. HYPO'XIS.

Spathe 2-leaved; perianth persistent; capsule elongated, narrowed at the base; seeds numerous, roundish, with a black, crustaceous integument.

Gr. ὑπω, under, οξυς, sharp; on account of the pointed base of the fruit. Small, bulbous, grass-like plants, with yellow flowers. Lvs. radical, linear.

H. ERE'CTA.

Pilose; *scape* about 4-flowered, shorter than the linear-lanceolate leaves. In woods and meadows. Leaves all radical, 6—12 inches long, 3—5 lines wide, very acute. The slender, hairy scapes, several from the same root, arise 6—8 inches, divided at top into a sort of umbel with 3—5 peduncles having each a minute, subulate spathe at the base. Perianth hairy and greenish without, yellow within; segments oval, rather obtuse. Jn. *Yellow Star-grass.*

ORDER CL. IRIDACEÆ. *The Iris Tribe.*

Per.—Tube adherent to the ovary, limb 6-parted, colored, in 2 often unequal series.
Sta.—3, alternate with the 3 petals. *Anthers* 2-celled, extrorse.
Ova.—3-celled, many-ovuled. *Style* 1. *Stigmas* 3, dilated or petaloid.
Fr.—Capsule 3-celled, 3-valved, with loculicidal dehiscence. *Seeds* numerous, with hardened, fleshy albumen.

Perennial herbs, arising from bulbs, corms or rhizomas, rarely from fibrous roots. Leaves equitant, mostly distichous. Flowers with spathaceous bracts. They are chiefly natives of the Cape of Good Hope, or of the middle of Europe or North America.

Properties. More remarkable for their beauty than their utility. Some of them are cathartic, as Iris uberosa. The aromatic *oris-root* is the dried rhizoma of Iris florentina of S. Europe. *Saffron* consists of the dried orange-colored stigmas of Crocus sativus.

Conspectus of the Genera.

Flowers regular.	Petals smaller than the sepals.	Stamens distinct.	*Iris.*	1
		Stamens united.	*Tigridia.*	3
	Pet. and sep. subequal, spreading, flat; tube short.	subereet, tube very long.	*Crocus.*	5
			Sisyrinchium.	4
Flowers irregular.	Stamens distinct, ascending. Seeds winged.		*Gladiolus.*	2

1. IRIS.

Sepals 3, reflexed, larger than the 3 erect petals; stamens distinct; style short or 0; stigmas petaloid, covering the stamens.

Name from the Greek, signifying *rainbow;* on account of the varied colors of the flower. Lvs. mostly ensiform.

1. I. VERSI'COLOR.

Stem terete, flexuous; *leaves* ensiform; *flowers* beardless; *ovary* triangular, with concave sides and roundish angles. Grows in wet grounds, where its large, blue flowers are conspicuous among the grass. Rhizoma large, horizontal, acrid. Stem 2—3 feet high, acute on one side, often branched and bearing several flowers. Leaves a foot long, ½—1 inch wide, erect, sheathing at base. Sepals spathulate, purple, the claw variegated with green, yellow and white, with purple lines. Petals erect, paler, a little shorter than the stigmas. Style short, bearing 3 petaloid stigmas which are reflexed and bifid at the end, purple or violet, concealing the stamens beneath. Anther oblong; seeds flat. June.

β. *sulcata* (*Torr.*); *stem* nearly straight; *petals* longer than the stigmas; *angles of the ovary* sulcate. *Blue Flag.*

2. I. PRISMA'TICA. *Bic.* I. Virginica. *Torr.*

Stem round, slender, few-flowered; *leaves* linear, long; *flowers* beardless; *ovary* triangular, the side doubly grooved. In similar situations with the last, readily distinguished by its very slender habit. Rhizoma fleshy. Stem smooth. 1—2 lines in diameter, 1—2 feet high, branching at top, and bearing 2—6 flowers. Bracts at the base of the branches, withering. Leaves few, alternate, grass-like, 6—10 inches long, amplexicaul. Sepals narrow, yellow, edged with purple. Petals linear-lanceolate. June. *Boston Iris.*

3. I. PLICA'TA.—*Stem* many-flowered, longer than the leaves; *segments of the perianth* emarginate, outer ones flat; *leaves* bent inwards at the point; *spathe* membranaceous at the apex; *flowers* beardless, lower ones pedunculate; *stigmas* with acute, serrate divisions. Native of the South of Europe. Common in gardens. The prevailing color of the flower is light blue, often fading to white. May. *Flower-de-Luce. Fr. Fleur-de-lis.*

4. I. PU'MILA.—*Scape* very short (3—6 inches), 1-flowered; *spathe* shorter than the tube; *sepals* reflexed, narrower than the erect petals. A

small species from Hungary, cultivated in the edgings of walks. Leaves numerous, broad-ensiform, suberect. Flowers large, deep purple, appearing in early spring. *Dwarf Iris.*

5. I. OCHROLEU'CA.—Beardless; *leaves* ensiform, depressed, striate; *scape* subterete; *ovary* 6-angled. A tall species, from Levant. Stem 3—4 feet high. Flowers ochroleucous or sulphur-yellow. July.

6. I. CHINE'NSIS.—*Scape* compressed, many-flowered; *stigmas* lacerated. A small species from China. Flowers elegantly striped. A few other species are rarely cultivated in gardens. *China Iris.*

2. GLADIO'LUS.

Spathe 2-leaved; perianth irregular; stamens distinct, ascending; stigmas 3; seeds winged.

Lat. *gladius*, a sword; in reference to the form of the leaves. A large genus of bulbous plants, with large and showy flowers. None native.

G. COMMU'NIS.—*Spike* unilateral; *upper segment of the perianth* covered by the lateral ones, 3 lower marked by a white, linear-lanceolate spot, lowest very large. A fine border flower, from S. Europe. Stem 2—3 feet high, with the flowers arranged in a long, somewhat spiral row upon it. Perianth large, deep red, variegated with white. Its colors are liable to considerable variation. July. *Corn Flag.*

3. TIGRI'DIA.

Spathe 2-leaved; the 3 sepals larger than the 3 petals; stamens monadelphous; filaments united into a long tube.

Named in reference to the large, spotted flowers. Exotic.

T. PAVO'NIA.—*Stem* simple, flexuous; *leaves* ensiform, nerved; *segments* flat; *petals* panduriform. A superb bulbous plant, with large, beautiful flowers, native of Mexico and Peru. Stem 2 feet high or more, erect, round, leafy, somewhat branched. Leaves erect, smooth, a foot long. Flower inodorous, 5—6 inches broad, yellow, variegated with scarlet, crimson and purple. It is very evanescent, lasting but a few hours, but a new one appears daily for several weeks. It ripens seeds, from which, or from offsets, it may be increased. July—Sept. *Tiger-flower.*

4. SISYRI'NCHIUM.

Spathe 2-leaved; segments of the perianth flat, equal; stamens monadelphous; stigma 3-cleft.

Gr. συς, a hog, and ρυγχος, a snout; whether from the fondness of swine for rooting it up or from some fancied resemblance we know not. Grass-like plants, with compressed, ancipital scapes.

1. S. ANCEPS.

Scape simple, winged; *valves of the spathe* unequal, shorter than the flowers; *petals* mucronate. A delicate little plant, with blue flowers, common in low grass-lands. Stem or scape 10—12 inches high, so winged as to resemble the leaves, smooth and mostly simple. Leaves linear, about as long as the scape, sheathing at base. Spathe of 2, nearly equal, acuminate valves, 2—5-flowered. Flowers purple or blue, on filiform pedicels. Sepals a little broader than the petals, spreading. Capsules globose. Jn, Jl. *Blue-eyed-grass.*

2. S. MUCRONA'TUM.

Scape simple, subsetaceous; *spathe* colored, outer valve longer than the peduncles, ending in a long, mucronate point. Found in wet meadows where the grass is not luxuriant. Leaves radical, a line wide. Scape 6—10 inches high. Spathe of 2 very unequal valves, 3—4-flowered, tinged with purple. Flowers smaller than in the preceding, of a fine blue color. June.

5. CROCUS.

Perianth funnel-form, the segments united at base into a long and slender tube; stigma 3-cleft, convolute, crested.

Named from the youth *Crocus*, who, according to Grecian mythology, was changed into this flower. Spathe radical, 1—2 leaved, thin, transparent. The long tube of the flower nearly or quite sessile upon the bulb. After flowering the ovary arises from the ground by the growth of the scape, to ripen its seeds in the sun.

1. C. SATI'VUS.—*Leaves* linear, revolute at the margins; *stigma* 3-parted, as long as the corolla, reflexed. From Asia. Stem bulbous. Leaves radical, with a longitudinal, white furrow above. Flower nearly or quite sessile on the bulb, with a long white tube, and purple, elliptical segments. Stigmas long, emarginate, exsert, of a deep orange-color. Its virtues, both medicinal and coloring, reside chiefly in the large stigmas. Sept. A variety, perhaps the most common, has yellow perianths. *Saffron.*

2. C. VERNUS.—*Stigmas* included within the flower, with 3, short, wedge-shaped segments. Native of the Alps. Stem bulbous. Scape an inch or two high, 3-sided. Flowers vary in color, generally purple, often yellow or white; tube very long, slender, gradually enlarged upwards, closed at the mouth with a circle of hairs, limb campanulate, much shorter than the tube. Anthers yellow, sagittate. Flowers in March or April. The Crocus is propagated in gardens, chiefly by bulbs. *Spring Crocus.*

ORDER CLI. DIOSCORIACEÆ. *The Yam Tribe.*

Fls.—Diœcious. *Perianth* tube adherent to the ovary; segments of limb 6, in 2 series.
STERILE.—Stamens 6, inserted into the base of the sepals and petals.
FERTILE.—Ovary 3-celled, cells 1—2-ovuled. *Styles* and *stigmas* nearly distinct.
Fr.—Capsule 3-winged, compressed, 2 of the cells sometimes abortive.
Sds.—Flat, compressed. *Embryo* small, in cartilaginous albumen.

A small order of twining shrubs. Leaves usually alternate and reticulate-veined. Flowers inconspicuous. The only remarkable or useful product of this order is *yams*, an important article of food in all tropical countries. They are the large, mucilaginous, sweetish tubers of Dioscorea sativa, &c.

DIOSCO'REA.

Flowers diœcious; styles of the fertile flowers 3; cells of the capsule 2-seeded; seeds membranaceously margined.

Named in honor of Pedacius Dioscorides, a Greek physician and florist, who is supposed to have lived under Nero.

D. VILLO'SA.

Leaves alternate, opposite and verticillate, cordate, acuminate, pubescent beneath, 3-nerved; *stem* round. This delicate vine is occasionally found in low woods and hedges, flowering in June. Stem slender, smooth, twining

and climbing, 3—6 feet long. Leaves mostly alternate, 2—4 inches long, $\frac{2}{3}$ as wide, smooth above, smooth or villous beneath, on reflexed and channeled footstalks. Flowers minute, numerous, red, sessile in small fascicles or racemes, arranged in an alternate manner upon a long, slender axillary common peduncle. June, July. *Yam-root.*

ORDER CLII. SMILACACEÆ. *The Smilax Tribe.*

Fls.—Diœcious or perfect. *Perianth* free from the ovary, 6-parted, regular.
Sta.—6, inserted into the base of the segments.
Ova.—3-celled; cells 1 or many-seeded.
Fr.—Berry roundish, few or many-seeded. *Seeds* with cartilaginous albumen.

A small order of herbs or shrubby plants, often climbing. Leaves reticulately veined. This last circumstance chiefly distinguishes this order from the following. *Sarsaparilla* of the shops consists chiefly of the roots of several foreign species of smilax.

SMILAX.

Flowers diœcious; perianth broad-campanulate. *Sterile.*—Anthers adnate. *Fertile.*—Style minute; stigmas 3; berry 3-celled, 1—3-seeded.

Gr. σμιλη, a grater; the stems of some species are rough with prickles.

1. S. ROTUNDFO'LIA.

Stem suffruticose, prickly, terete; *leaves* unarmed, orbicular, oval or ovate, short-acuminate, 5—7-nerved; *common peduncle* about as long as the petioles. A strong, thorny vine, extending 10—40 feet in hedges and thickets. Stem woody, smooth except the scattered thorns which proceed from the wood. Branches 4-angled. Leaves 2—3 inches long, $1\frac{1}{2}$—3 inches wide, cordate or tapering at base. Tendrils strong, from the top of the wings of the petioles. Flowers small, greenish, in small, axillary umbels. Berries round, black. June. *Round-leaved Smilax. Green Briar.*

β. *caduca* (S. caduca, *L.*); *leaves* ovate; *common peduncles* longer than the leaves. Stem 3—10 feet long.

2. S. HERBA'CEA. *L.* S. peduncularis. *Muh.*

Stem herbaceous, unarmed, angular, erect, or inclining; *leaves* ovate, 7—9-nerved, cuspidate; *umbels* on long peduncles. A coarse, smooth, ill-scented plant, in thickets and low grounds. Stem slightly angled, 3—6 or 8 feet high, usually nodding with its slender summit and few small branches, and leaning on other plants or on each other. Leaves 2—3 inches long, $\frac{1}{2}$—$\frac{3}{4}$ as broad, paler beneath, the petioles winged at base and producing a long, slender tendril from the top of each wing. Fertile umbels simple, about 40-flowered, on peduncles 6—8 inches long, those of the sterile umbels shorter. Flowers yellowish green, diffusing about the plant an intolerably offensive and sickening odor. Berries dark blue. June.

β. *stem* more generally climbing by its tendrils; *leaves* broadly ovate, subcordate. *Herbaceous Smilax.*

ORDER CLIII. LILIACEÆ. *The Lily Tribe.*

Fls.—Perfect, regular. *Perianth* free from ovary, of 6 segments (rarely 4), colored.
Sta.—6 (rarely 4), inserted into the sepals and petals. *Anthers* introrse.
Ova.—3-celled, many-ovuled. *Styles* united into 1. *Stigma* often 3-lobed.
Fr.—Capsular or fleshy, with several or many seeds in each cell.
Sds.—Albumen fleshy.

An extensive order of herbs with parallel-veined leaves. Stems often bulbous or tuberous at base. Flowers generally large and richly colored. They are chiefly natives of temperate regions.

Properties. The order abounds in a bitter, stimulant principle and also in mucilage. Some of the bulbous species yield a nutritious diet, as the *asparagus*, *onion*, *garlic*. The well known active medicine, *squills*, is the bulb of Scilla maritima, of S. Europe. The various kinds of officinal *aloes*, are the product of several species of Aloe. The powerful astringent *dragon's blood*, is the concentrated juice of Dracæna Draco of the Canary Isles.

Conspectus of the genera.

* *Segments of the perianth scarcely cohering in a tube.*

Branches 0 or leafless.	Fls. campanulate,	on a scape,	erect.	*Tulipa.*	1
			solitary, drooping.	*Erythronium.*	4
			umbellate. &c.	*Convallaria.*	12
		on a leafy stem.	Petals with a grooved line.	*Lilium.*	2
			Petals with a honey cavity at base.	*Fritillaria.*	3
	Flowers subrotate,	racemose.	Valves 0; stamens hypogynous.	*Convallaria.*	12
			Valves 6, bearing the stamens.	*Asphodelus.*	10
		corymbose, pedicels bracted at base.		*Ornithogalum.*	8
		umbellate, from a leafy spathe.		*Allium.*	7
Branches leafy.	Leaves ovate. &c.		Sep. and petals recurved. Sds. few.	*Streptopus.*	15
	Leaves filiform, fasciculate.		Sepals and pet. erect. Sds. many.	*Uvularia.*	14
				Asparagus.	16

* * *Segments of the perianth cohering into a tube at base.*

Flowers on a scape.	Stamens inserted at top of the tube.	Tube straight. Native.	*Aletris.*	11
		Tube incurved. Exotic.	*Polyanthes.*	6
	Stamens inserted in the middle of the tube.		*Hyacinthus.*	9
	Stamens inserted at base of tube, declined.		*Hemerocallis.*	5
Flowers axillary on a leafy stem.			*Polygonatum.*	13

TRIBE 1. TULIPACEÆ.

Bulbous. Sepals and petals scarcely adhering in a tube. Integuments of the seed soft and pale.

1. TU'LIPA.

Perianth campanulate; stamens short, subulate; anthers 4-angled; stigma thick; capsule oblong, triangular.

From the Persian name *thou'iban*, synonymous with turban; a name not inappropriate to the form of these magnificent flowers. Fls. solitary, terminal. A favorite genus of about 20, chiefly oriental species. Only two are generally cultivated.

T. GESNERIA'NA.—*Scape* 1-flowered, smooth; *leaves* ovate-lanceolate; *flower* erect, segments obtuse, smooth. Named for *Gesner*, a Zurich botanist. It appears to have been introduced into Europe from Persia in 1559. Its varieties are endless, and may be produced by first planting the seed in a rich soil, and afterwards transplanting the bulbs into a poorer soil. After a few years, the flowers become broken or variegated with colors in that exquisite manner so much admired. In London catalogues there are enumerated and described nearly 700 varieties. May. *Common Tulip.*

T. SUAVEOLENS differs from T. Gesneriana, in having a pubescent scape and fragrant flowers. It is moreover much smaller, and blossoms earlier.

2. LI'LIUM.

Perianth campanulate, segments mostly recurved, each with a longitudinal groove within, from the middle to the base; valves of the capsule connected by latticed hairs.

Gr. λειριον, the lily; from the Celtic word *li*, white, of which color the *lily* is considered the emblem. Stems leafy. Lvs. cauline, sessile, alternate or verticillate. Fls. terminal. Sta. shorter than style. Capsule subtriangular.

1. L. CANADE'NSE.

Leaves mostly verticillate, lanceolate, the nerves hairy beneath; *peduncles* terminal, elongated, usually by 3s; *flower* nodding, the segments spreading, scarcely revolute. A plant of much beauty, frequently adorning our meadows in summer. The root affords a fine example of the scaly bulb. Stem round, 2—4 feet high, surrounded by several remote whorls, each consisting of 4—6 leaves, and often a few scattered ones at base. These are 2—3 inches long ½—1 wide. Flowers few (1, 2 or 3), pendulous, yellow or orange-colored, spotted with dark purple inside. July. *Yellow Lily.*

2. L. SUPE'RBUM.

Leaves linear-lanceolate, acuminate, 3-nerved, glabrous, lower ones verticillate, upper ones scattered; *flowers* often in a pyramidal raceme, nodding, segments revolute. Few cultivated plants are more ornamental than this inhabitant of our vales and meadows. Root bearing a white, squamose bulb. Stem erect, round, straight, 4—6 feet high. Leaves 2—3 inches long, ⅓—⅔ inch wide. Flowers 3—20 (30—40, in specimens found at Hanover, N. H.), of a bright orange color with purple spots. Sepals and petals linear-lanceolate, beautifully revolute. Appears to be distinct from the foregoing. July. *Superb Lily.*

3. L. PHILADE'LPHICUM.

Leaves verticillate, linear-lanceolate; *flowers* erect, subsolitary, campanulate; *petals* and *sepals* unguiculate. A very beautiful plant, native of dryer situations than the former, as bushy pastures and field borders. Leaves about 5 in a whorl, 2—3 inches long, 3—4 lines wide, 1-nerved. Stem 15—20 inches high, with 1 (seldom more) erect flower at the summit. Segments lanceolate, standing apart, on long claws, deep orange-color, spotted at the base. June. *Red Lily.*

4. L. CA'NDIDUM.—*Leaves* scattered, lanceolate, narrowed at the base; *flower* campanulate, smooth inside. Native of Levant. It has a thick stem 4 feet high, supporting a raceme of very large, snow white flowers which have long been regarded as the emblems of whiteness and purity. Jl. *White Lily.*

5. L. BULBI'FERUM.—*Leaves* scattered, 3-nerved; *flowers* campanulate, erect, rough within. Native of Italy. Stem thick, round, 4 feet high, bearing small, roundish, dark-colored bulbs in the axils of the leaves. Flowers large, orange-colored, resembling in form those of *L. candidum*, but are scabrous within. July. *Orange Lily.*

6. L. JAPO'NICUM.—*Leaves* scattered, lanceolate; *flowers* cernuous, campanulate. Native of China. A noble species, requiring careful management. Its flower is large, nodding, terminal, white, on a stem 2 feet high.

7. L. TIGRI'NUM.—*Leaves* scattered, sessile, 3-nerved, the upper cordate-ovate; *perianth* revolute, papillose inside. Native of China, very common in cultivation. Stem 6 feet high, with a pyramid of dark orange-colored, spotted flowers. Axils of leaves bulbiferous. Aug. *Tiger-spotted Lily.*

3. FRITILLA'RIA.

Perianth campanulate, with a broad base and nectariferous cavity above the claw of each segment; stamens as long as the petals.

Lat. *fritillus*, a chess-board; alluding to the checkered petals.

1. F. IMPERIA'LIS.—*Raceme* comose, naked below; *leaves* entire. Native of Persia. A fine showy flower of easy culture. Stem thick, striate, 3 feet high, the lower part invested with the long, narrow, entire leaves; the upper part is naked, bearing at the top a raceme of several large, red or yellow, nodding flowers, beneath a crown formed by the pairs of small, narrow leaves at the base of each pedicel. May. *Crown Imperial.*

2. F. MALEA'GRIS.—*Leaves* alternate, linear, channeled; *stem* 1-flowered. Native of Britain. Stem a foot high, with alternate, long, very narrow leaves. The flower, which is usually solitary, is large, nodding, and beautifully checkered with purple and pale red or yellow. May. *Checkered Fritillary.*

4. ERYTHRO'NIUM.

Perianth campanulate, segments recurved, the 3 inner ones (petals) usually with a tubercle attached to each side at base, and a groove in the middle.

Gr ερυθρος, red; in allusion to the color of the flower and leaves of some species. Lvs. 2, subradical. Scape 1-flowered. Fl. liliaceous. Caps. somewhat stiped; seeds ovate.

1. E. AMERICA'NUM. *Smith.* E. dens-canis. *Mx.*

Scape naked; *leaves* spotted, lanceolate and involute at the point; *segments* oblong-lanceolate, obtuse, inner ones bidentate near the base; *style* clavate; *stigma* undivided. A beautiful little plant, among the earliest of our vernal flowers, found in rich, open grounds, or in thin woods. The bulb is deep in the ground. Scape slender, 3—4 inches high. The 2 leaves are of equal length (5 inches), one of them nearly twice as wide as the other, both clouded with brown spots. Flower drooping, yellow, revolute in the sunshine. May. *Yellow Erythronium.*

2. E. ALBI'DUM. *Nutt.*

Leaves elliptic-lanceolate; *segments of perianth* linear-lanceolate, rather obtuse, inner ones without dentures at base, subunguiculate; *stigma* 3-cleft, lobes reflexed. About the size of the last, in wet meadows, near Albany, N. Y. Leaves without an acumination, tapering to the base, of equal length including the petiole (4—5 inches), one of them twice as wide as the other. Scape a little longer than the leaves, bearing a single, white, nodding flower. Segments $1\frac{1}{4}$ inch long. April. May. *White Erythronium.*

3. E. BRACTEA'TUM. *Bw.*

Scape bracted; *leaves* lanceolate, very unequal. An alpine species, found in Vt. *Boott.* A smaller plant, distinguishable by the inequality of the leaves, one of which is 3 or 4 times as large as the other. Scape shorter than the leaves with a narrow, lanceolate bract $1\frac{1}{2}$ inch long, a little below the flower. Flower greenish yellow. Segments about $\frac{3}{4}$ inch long, gibbous at base. June. *Bracted Erythronium.*

TRIBE 2. HEMEROCALLIDEÆ.

Bulbous. Sepals and petals united into a tube. Integuments of the seed soft and pale.

5. HEMEROCA'LLIS.

Perianth campanulate, with a cylindric tube; stamens declined; stigma simple, villous, small.

Gr. ἡμερα, the day, and καλλος, beautiful; flowers beautiful, but lasting only a day. An ornamental genus of the easiest culture.

1. H. FULVA.

Leaves linear-lanceolate, carinate; *petals* obtuse, wavy; *nerves of sepals* branched. Native of the Levant, naturalized in some parts of this country. A well known, showy border flower. Leaves very numerous, mostly radical, an inch wide and a foot or more long. Scape round, thick, naked, smooth, branching, 3 feet high. Flowers very large, liliaceous, of a tawny red. Style striate. July. *Common Day Lily.*

2. H. FLAVA.—*Leaves* broad-linear, carinate; *segments* flat, acute; *nerves of the sepals* undivided. Native of Siberia. A foot high. Flowers a bright yellow, much smaller than those of H. fulva. Scape branching. July. *Yellow Day Lily.*

3. H. JAPO'NICA.—*Leaves* cordate, ovate, acuminate; *flowers* infundibuliform. A fine species from Japan. Leaves as large as the hand, very smooth, on long, radical petioles. Flowers large, white, on a scape a foot high. June. *White Day Lily.*

6. POLYA'NTHES.

Perianth funnel-form, incurved; filaments inserted into the throat; ovary at the bottom of the tube.

Gr. πολυς, many, ανθος; the flowers of the plant being numerous.

P. TUBERO'SA.—*Leaves* linear-lanceolate; *petals* oblong. A fine parlor plant, native of Ceylon. Stems bulbous at base with tuberous branches. Scape scaly, 2—3 feet high, with alternate, large, white, regular flowers, of a delicious fragrance which is most powerful at evening. Aug. Sept. *Tuberose.*

TRIBE 3. SCILLEÆ.

Bulbous. Flowers usually smaller than in the preceding. Integument of the seed black and brittle.

7. A'LLIUM.

Flowers in a dense umbel, with a membranous, 2-leaved spathe; perianth deeply 6-parted, mostly spreading.

Celtic *all*, hot or burning. Strong-scented bulbs. Lvs. mostly radical. Umbel on a scape. Segments of perianth ovate, the 3 inner somewhat smaller. Ova. angular. Stig. acute. Caps. 3-lobed.

1. A. TRICO'CCUM.

Scape terete; *leaves* lanceolate, oblong, flat, smooth; *umbel* globose; *seed* solitary in each cell of the 3-celled capsule. A strong-scented plant, common in damp woods. Bulb oblong, acuminate. Leaves 5—8 inches long, an inch or more wide, acute, tapering into a petiole, all withering and disappearing before the opening of the flowers. Scape a foot or more high, bearing a thin, 2-leaved deciduous spathe at top, with an umbel of 10—12 white flowers. June, July. *Lance-leaved Garlic.*

2. A. CANADE'NSE.

Scape terete; *leaves* linear; *umbel* capitate, bulbiferous. In woods. Leaves radical, $\frac{2}{3}$ as long as the scape, smooth, nearly flat above. Scape 12—18 inches high, round, smooth, bearing a spathe of 2 ovate, acute bracts at the top, with a head of bulbs and flowers. The bulbs are sessile, each furnished with a bract beneath, and among them are a few whitish flowers on slender pedicels. June. *Canadian Garlic.*

3 A. VINEA'LE.

Stem slender, with a few leaves; *cauline leaves* terete, fistulous; *umbel* bulbiferous; *stamens* exsert; *filaments* alternately tricuspidate, the middle point bearing the anther. Meadows. N. York. Leaves 6—12 inches long. Scape 1—2 feet high, bearing a spathe of 2 small bracts at top, and an umbel of flowers with which bulbs are sometimes intermixed. Perianth purple. June. *Crow Garlic.*

4. A. CE'RNUUM. *Roth.*

Scape quadrangular; *leaves* linear, flat; *umbel* cernuous; *stamens* simple. N. Y. *Dr. Beck.* Leaves radical, half as long as the scape. Scape 1—2 feet high, bearing at top a nodding umbel of 15—20 rose-colored flowers. Ovary 6-toothed, becoming a roundish, 3-seeded capsule. Jl. *Nodding Garlic.*

5. A. CEPA.—*Scape* fistulous, swelling towards the base, longer than the terete, fistulous leaves. *Cep*, in the Celtic, signifies a head. Native of Hungary. The root bears a tunicated bulb, compressed, or round, or oblong, in figure. The scape, which appears the second year, is 3—4 feet high, straight, smooth, stout, bearing at top a large, round umbel of greenish white flowers. Universally cultivated for the kitchen, and its peculiar merits as a pot-herb are, no doubt, well known to our readers. Culture has produced numerous varieties. Biennial. *Common Onion.*

6. A. SCHÆNOPRA'SUM —*Scape* equaling the round, subulate leaves. *Gr.* σχοινος, a rush, and πρασον, a leek. The leaves resemble rush leaves June. *Cives.*

7. A. ASCALO'NICUM.—*Scape* terete; *leaves* subulate; *umbel* globose; *stamens* tricuspidate. Native about Ascalon, Palestine. It has a soboliferous bulb, small, fistulous leaves, and seldom flowers. July. *Shallot.*

8. A. PORRUM.—*Stem* compressed, leafy; *leaves* sheathing at base; *stamens* tricuspidate. Native of Switzerland. Root bearing a scaly, cylindrical bulb. Stem 2 feet high, bearing long, linear, alternate, sheathing leaves, and at the top, a large umbel of small, white flowers. July. *Leek.*

9. A. SATI'VUM.—*Bulb* compound; *stem* leafy, bulbiferous; *stamens* tricuspidate. Native of Sicily. The bulb is composed of several smaller ones surrounded by a common membrane, acrid and very strong-scented. Stem 2 feet high Flowers small, white. Used as seasoning and sometimes in medicine. July. *Common Garlic.*

10. A. PROLI'FERUM.—*Scape* fistulous, twisted; *leaves* fistulous; *umbels* bulbiferous and proliferous; *stamens* tricuspidate, the middle point antheriferous. A curious species, native of the W. Indies. Scape 2—3 feet high, producing several bulbs among, or instead of, the white flowers. July.

8. ORNITHO'GALUM.

Perianth deeply 6-parted, spreading above the middle; filaments dilated at the base; capsule roundish, angular.

Gr, ορνιθος, a bird, and γαλα, milk; why so called we know not. Leaves radical. Scape naked, racemose or corymbed.

O. UMBELLA'TUM.—*Flowers* corymbose; *peduncles* longer than bracts; *filaments* subulate. From England, but naturalized in many parts of this country. Leaves linear and narrow, emarginate, as long as the scape. Scape near a foot high. Flowers few, in a kind of loose corymb. Petals and sepals white, beautifully marked with a longitudinal green stripe on the outside. May. *Star of Bethlehem.*

9. HYACI'NTHUS.

Perianth subglobose or campanulate, regular, 6-cleft; 3 nectariferous pores at top of the ovary; stamens issuing from the middle of the segments; cells of the capsule about 2-seeded.

Hyacinthus, according to Grecian fable, was killed by Zephyrus and transformed into this flower. The species are natives of the Levant.

H. ORIENTA'LIS.— *Perianth* funnel-form, half 6-cleft, ventricose at the base. The hyacinth is a well known, splendid flower, long prized and cultivated. Leaves thick, linear-lanceolate, 3—5 inches long. Scape twice as long as the leaves, thick, bearing a dense, thyrsoid raceme of numerous blue flowers. A plant peculiarly adapted to parlor cultivation in bulb glasses.

Other ornamental species sometimes cultivated are H. BOTRYOIDES, *grape hyacinth*, with globose flowers; H. COMOSUS, *purple grape hyacinth*, with prismatic flowers; and H. RACEMOSUS, *hare-bell hyacinth*, with ovoid flowers.

TRIBE 4. ANTHERICEÆ.

Not bulbous. Stem, if developed, erect. Root fasciculate or fibrous. Leaves never coriaceous nor permanent.

10. ASPHO'DELUS.

Perianth 6-parted, spreading, with 6 valves, covering the ovary; stamens issuing from the valves.

Gr. α, privative, and σφαλλω, to surpass; a flower *not surpassed* in beauty. Fine garden plants from S. Europe.

1. A. LU'TEUS.—*Stem* leafy; *leaves* 3-cornered. Native of Sicily. A plant of easy culture and rapid increase. Stem 3 feet high, thickly invested with 3-cornered, hollow leaves. Flowers yellow, in a long spike, reaching from the top almost to the base of stem. Jn. *King's Spear. Yellow Asphodel.*

2. A. RAMO'SUS.—*Stem* naked, branched; *peduncles* alternate, longer than bract; *leaves* ensiform, carinate, smooth. Native of S. Europe. Not so tall as the preceding, but with larger, white flowers. Jn. *Branching Asphodel.*

11. ALE'TRIS.

Perianth 6-cleft, tubular, rugose, persistent; stamens issuing at the top of the tube, style 3-sided, 3-partible; capsule opening at top, many-seeded.

Gr. (αλειας) αλειατρος, meal; from the powdery dust with which the plant is covered. Lvs. radical, rosulate. Scape many-flowered.

A. FARINO'SA.

Leaves broad-lanceolate; *flowers* oblong-tubular, pedicelled; *perianth* in fruit rugose or mealy in appearance. Grows in low grounds. Root premorse, intensely bitter. Scape 20—30 inches high, with remote scales or bracts and surrounded at base with a circle of lanceolate, sessile leaves. These are 3—4 inches long. $\frac{1}{4}$ as wide and lie flat upon the ground. Flowers in a long, thin raceme. Perianth white, $\frac{1}{3}$ inch long, on very short pedicels, rugose without, when old. Medicinal. July. *Star-grass. Colic-root.*

Tribe 5. CONVALLARINEÆ.

Stem arising from a horizontal rhizoma or tuber.

12. CONVALLA'RIA.

Perianth 4—6-parted, segments spreading; stamens 4—6, divergent, arising from the base of the segments; berry globose, 2—3-celled.

Lat. *convallis*, a valley; the locality of some species. Stem simple. Lvs. alternate. Fls. in terminal racemes or umbels.

1. C. BIFO'LIA. *L.* Smilacina. *Desf.* Styrandra. *Raf.*

Leaves 2—3, cordate; *flowers* tetramerous. A small plant, not uncommon in the edges of woods and waste lands, singularly distinguished for its 4-parted flowers. Stem angular, about 6 inches high. Leaves 2, rarely 3, about 2 inches long, ½ as wide, ovate, distinctly cordate, sessile, or the lowest on a petiole. Raceme terminal, erect, an inch long, consisting of 12—20 white flowers. Berry small, round, and when mature, pale red, speckled with deep red. May. *Two-leaved Solomon's Seal.*

2. C. TRIFO'LIA. *L.* Smilacina. *Desf.*

Leaves 3—4, oval-lanceolate, tapering to both ends, amplexicaul; *raceme* terminal, simple. A delicate little species in mountain swamps. Stem 3—5 inches high, pubescent, angular. Leaves 2—3½ inches long, one fifth as wide, acuminate, smooth. Flowers 4—8, white, 6-parted, the segments spreading. May. *Three-leaved Solomon's Seal.*

3. C. STELLA'TA. *L.* Smilacina. *Desf.*

Leaves numerous, ovate-lanceolate, amplexicaul; *raceme* few-flowered, simple. River banks. Stem ¾—1 foot high, round and smooth. Leaves 8—10, smooth, glaucous beneath, 4—6 inches long, ¾—1 inch wide, tapering to the apex. Flowers white, about 8, stellate, rather larger than in the next. June. *Star-flowered Solomon's Seal.*

4. C. RACEMO'SA. *L.* Smilacina. *Desf.*

Leaves oval, acuminate, subsessile; *raceme* compound. A larger species than the preceding. Rhizoma thick, sweet to the taste. Stem 1½—2 feet high, downy, gracefully recurved at top. Leaves 4—6 inches long, about ⅓ as wide, contracted into a long acumination, nerved, minutely pubescent. Petioles 0—2 lines long. Flowers very numerous, small, white, on white pedicels, and with white, exserted, tapering filaments, constituting a large, compound, terminal raceme. Woods, &c. June. *Clustered Solomon's Seal.*

5. C. BOREA'LIS. C. umbellulata. *Mx.* Dracæna. *Ait.* Clintonia. *Raf.*

Leaves oval-lanceolate; *scape* umbellate; *berries* 2-celled. A plant of much elegance of form, found in woods especially in mountainous districts. Rhizoma creeping to some extent. Leaves 4—7 inches long, ⅓ as wide, petiolate, radical or nearly so, smooth and glossy, fringed with scattered hairs. Scape erect, round, 8—13 inches high, bearing at top a beautiful umbel of 3—6 yellowish green, nodding flowers. Perianth liliaceous, of 6, oblanceolate, erect, spreading segments. Berries of a rich amethystine blue. Jn. *Wild Lily of the Valley.*

6. C. MAJA'LIS.—*Scape* naked, smooth, semi-cylindric; *leaves* nearly radical, ovate; *raceme* simple, 1-sided. An elegant, sweet scented plant, native of woods at the South, and is, or deserves to be, a frequent inhabitant of our gardens. Leaves 2, seldom 3, ovate-elliptical. Scape 6 inches high, with white flowers depending from its upper half in a single rank. May. *Lily of the Valley.*

13. POLYGONA'TUM.

Perianth tubular, cylindrical, 6-cleft; stamens inserted near the summit of the tube; berry globose, 3-celled, cells 2-seeded.

Gr. πολυς, many, γονυ, knee; from the many-jointed rhizoma. Stem simple. Lvs. alternate. Fls. axillary.

P. MULTIFLO'RUM. *Hook.* P. pubescens, biflora, canaliculata, &c. *P. Stem* recurved, smooth; *leaves* distichous, lanceolate, amplexicaul, smooth above; *peduncles* axillary, 1—4-flowered. In woods. Stem 1—3 feet high, most recurved in the tallest plants. Leaves more or less clasping at base, or only sessile in the smallest plants, $2\frac{1}{2}$—6 inches long, 1—$2\frac{1}{2}$ wide, nerved, smooth and glossy above, paler and generally pubescent beneath. Peduncles filiform, branching, scarcely a fifth as long as the leaves. Flowers 5—8 lines long, pendulous, greenish subcylindric. June. *Jointed Solomon's Seal.*

α. *leaves* very amplexicaul, smooth both sides, distinctly nerved; *lower peduncles* 4-flowered. Plant 2—3 feet high. In rich, damp soils.

β. *pubescens; leaves* pubescent beneath, slightly clasping; *stem* 1—2 feet high. This variety is most common in New England.

γ. *biflora*; *leaves* smooth both sides, $\frac{1}{4}$ as wide as long, sessile; *flowers* greenish white, 4—5 lines long; *stem* round. 1—$1\frac{1}{2}$ foot high.

δ. *canaliculata; stem* channeled on the upper side.

14. UVULA'RIA.

Perianth deeply 6-parted; segments linear-oblong, acute, erect, with a nectariferous cavity at the base of each; filaments very short; anthers linear, half as long as the petals; style trifid; seeds with an aril.

Derivation uncertain. Leaves alternate. Flowers solitary. Capsule 3-celled, many-seeded.

1 U. SESSILIFO'LIA.

Leaves sessile, lance-oval, glaucous beneath; *capsule* stiped ovate. A common species, found in woods and in grass lands. Stem smooth, slender, 6—10 inches high, dividing at the top into 2 branches, one bearing leaves only, the other, leaves and a flower. Leaves smooth and delicate, dark green above, paler beneath, 1—$1\frac{1}{2}$ inches long. The flower is cylindric, near an inch long, yellowish white, of 6, long linear petals. May. *Bell-wort. Wild Oats.*

2. U. PERFOLIA'TA.

Leaves perfoliate, elliptical, subacute; *perianth* subcampanulate, tuberculate-scabrous within; *anthers* cuspidate; *capsule* truncate. A handsome, smooth plant, in woods. Stem 10—14 inches high, passing through the perfoliate leaves near their bases, and dividing into 2 branches at top. Leaves 2—3 inches long, $\frac{2}{3}$—1 inch wide, rounded at the base, acute at apex. Flower pale yellow, pendulous from the end of one of the branches. Segments linear-lanceolate, $1\frac{1}{4}$ inch long, twisted, covered within with shining grains. Anthers $\frac{3}{4}$ inch long. May. *Perfoliate Bell-wort.*

3. U. GRANDIFLO'RA.

Leaves perfoliate, elliptic-oblong, acute; *flower* terminal, solitary, pendulous; *segments* acuminate, smooth within and without; *anthers* obtuse. Larger than either of the foregoing. In woods. Stem 12—15 inches high, passing through the perfoliate leaves near their bases, dividing into 2 branches at top, one of which bears the large, yellow, pendulous flower. Lvs. almost acuminate, rounded at base. Anthers $\frac{3}{4}$ inch long. May. *Large Bell-wort.*

15. STREPTO'PUS.

Perianth 6-parted, campanulate; segments with a nectariferous pore at the base of each; anthers longer than the filaments; stigma very short; berry roundish, 3-celled; seeds few, hilum without an aril.

Gr. στρεφω, to turn, and πους, a foot; in botanic language, a twisted footstalk, the peduncle of each flower being constantly twisted in a peculiar manner. Fl. solitary, axillary.

1. S. AMPLEXIFO'LIUS. *Dc.* S. distortus. *Mx.* Uvularia. *L.*

Smooth; *leaves* oblong-ovate, clasping, smooth and entire on the margin, glaucous beneath; *pedicels* solitary, geniculate and distorted in the middle; *sepals* long-acuminate, reflexed; *anthers* very acute, entire; *stigma* truncate. Native of woods. Stem round, dichotomous, 2 feet high. Leaves 2—3 inches long, ½ as wide, very smooth. Peduncles opposite the leaf, twisted and bent downwards each with a bell-form, drooping flower gibbous at base, of a pale straw-color. Anthers sagittate, attenuate at the apex into a long, subulate point. Fruit oblong, red, many-seeded. Jn. *Twisted Bell-wort.*

2. S. RO'SEUS. *Mx.* Uvularia. *L.*

Smooth; *leaves* oblong-ovate, clasping, margin serrulate-ciliate, under surface green like the upper; *pedicels* short, generally distorted in the middle; *segments* spreading at apex; *anthers* short, 2-horned; *stigma* trifid. A more common species, native of woods. Stem a foot or more high, round, dichotomously branching. Leaves 2—4 inches long, ⅓ as wide, ending in a slender point, smooth, but conspicuously edged with minute, rough hairs. Flowers reddish, spotted, suspended beneath the branches, one under each leaf. June. *Rose Bell-wort.*

TRIBE 6. ASPARAGEÆ.

Stem usually fully developed, or if not, the leaves are coriaceous and permanent.

16. ASPA'RAGUS.

Perianth 6-parted, erect; ovary turbinate; stamens erect; style very short; stigmas 3; berry 3-celled, cells 2-seeded.

Gr. σπαραασσω, to tear; some of the species are armed with strong prickles.

A. OFFICINA'LIS.

Stem herbaceous, unarmed, very branching, erect; *leaves* setaceous, flexible, fasciculate. Native of England, and other parts of Europe, naturalized on rocky shores. Stem 2—4 feet high. Leaves filiform, ½—1½ inch long, pale pea-green. Flowers axillary, solitary or in pairs. Berries globose, red. It is one of the oldest and most delicate of culinary vegetables, was no less praised in ancient Rome, by Pliny, Cato and other writers, than at the present day. Diuretic. July. *Asparagus.*

ORDER CLIV. PONTEDERIACEÆ. *The Pickerel-weed Tribe.*

Perianth tubular, colored, 6-parted, often irregular, circinate in æstivation.
Sta.—3 or 6, unequal, perigynous.
Ova.—Free or sometimes adherent to the perianth at base, 3-celled. *Style* 1. *Stig.* simple.
Fr.—Capsule 3 (sometimes 1)-celled, 3-valved, with loculicidal dehiscence.
Seeds numerous (sometimes solitary), attached to a central axis. Albumen farinaceous.

A small order of aquatic plants. Leaves sheathing, parallel-veined. Inflorescence various, often spathaceous. Of no known use.

Conspectus of the Genera.

Flowers regular,	solitary.	*Schollera.*	2
	2—4 together in a spathe.	*Heteranthera.*	3
Flowers irregular, in a terminal spike.		*Pontederia.*	1

1. PONTEDE'RIA.

Perianth bilabiate, tubular at base, under side of the tube perforated with 3, longitudinal clefts, the lower part persistent; stamens unequally inserted, 3 near the base and 3 at the summit of the tube; utricle 1-seeded.

Named in honor of Julius Pontedera, a botanic author and professor, of Padua, about 1720. Fls. blue, mostly spicate.

P. CORDA'TA.

Leaves subradical, cordate-oblong; *flowers* spiked. A fine conspicuous plant, native of the borders of muddy lakes, &c., growing in patches extending from the shores to deep water. Stem thick, round, erect, arising 1—2 feet above the water, bearing a single leaf. Leaves 4—7 inches long, 1½—3 wide, very smooth and glossy, almost sagittate, with veins beautifully arranged to conform to the margin. Flowers in a spike, arising above the spathe, very irregular. Perianth 2-lipped, each lip 3-cleft, always blue, appearing in July. *Pickerel-weed.*

β. angustifolia (*Torr.*); *leaves* narrow, truncate and subcordate at base.

2. SCHO'LLERA.

Spathe 1-flowered; tube of the perianth very long and slender, limb 6-parted, equal; anthers of 2 forms; capsule 1-celled, many-seeded.

Named for F. A. Scholler, a German botanist. Lvs. alternate, sheathing at base.

S. GRAMI'NEA. *Schreb.* Leptanthus. *Mx.*

Stem floating, rooting at the lower joints; *leaves* linear. A grass-like aquatic, in flowing water. Stem slender, dichotomous, 1—2 feet long. Leaves 3—6 inches long, 1—2 lines wide, obtuse at apex, slightly sheathing at base. Flower solitary, issuing from a short (1 inch) spathe. Tube 1½ inch long, limb in 6, linear-lanceolate segments, yellow. Stamens 3 (4, *authors*); filaments broad, one of them abortive, the other 2 with linear anthers longer than the thick style. Jl. Aug. *Yellow-eyed Water-grass.*

3. HETERA'NTHERA.

Spathe several-flowered; tube of the perianth long and slender, limb 6-parted, equal; stamens 3; anthers of 2 forms; capsule 3-celled, many-seeded; dissepiment contrary.

Gr. ἑτέρα, otherwise, ἀνήρ; the anthers being dissimilar in the same flower.

H. RENIFO'RMIS. *Ruiz and Pavon.* Leptanthus. *Mx.*

Stem prostrate or floating; *leaves* suborbicular, reniform or auriculate at base; *spathe* acuminate, few-flowered. On muddy or inundated banks.

Stem 4 inches to a foot or more in length. Leaves ½ inch long, ¾ inch broad, on petioles 1—2 inches long, with a broad sinus at base and a short, abrupt acumination. Spathe closely enveloping the 2 or 3 very evanescent, white flowers. Tube of the perianth ½ inch long, limb in 6 oblong segments. Filaments inserted at the orifice, 2 of the anthers small, round, yellow, the other oblong, greenish. July. Aug.

ORDER CLV. MELANTHACEÆ. *The Colchicum Tribe.*

Perionth regular, in 2 series, each of 3 segments which are distinct or united at base, generally involute in æstivation.
Sta.—6, with extrorse anthers.
Ova.—3-celled, 9—many-ovuled. *Styles* distinct or 0. *Stigmas* undivided.
Fr.—Capsule or berry 3-celled, generally with septicidal dehiscence.
Seeds with a membranous testa, and dense, fleshy albumen.

Herbs with bulbs, rhizomas, corms, or fasciculate roots. Leaves parallel (rarely reticulate)-veined.

Properties. The order is generally pervaded by drastic, narcotic and poisonous qualities, most powerful in Veratrum and Colchicum. The corms and seeds of the latter are the most important medicinal products of the order. Their virtue is due to an *alkaline* principle called *veratria*, which is found in this genus, as well as in most of the others.

Conspectus of the Genera.

Leaves alternate	Sepals and petals sessile, without glands,	Ovaries 1.	*Helonias.*	4
		Ovaries 3.	*Veratrum.*	3
	Sepals and petals with 2 glands at base.	Stamens perigynous.	*Melanthium.*	1
		Stamens hypogynous.	*Zigadenus.*	2
Leaves verticillate,	in two unequal whorls.		*Medeola.*	6
	in a single whorl of 3.		*Trillium.*	5

1. MELA'NTHIUM.

Flowers monœcious-polygamous; perianth rotate, 6-parted, segments unguiculate, with 2 glands at base, the claws bearing the stamens; ovary often abortive; capsule exserted, subovoid, summit trifid and tipped with the 3 persistent styles; seeds margined.

Gr. μελας, black, ανθος; alluding to the dark color of the flower. Leaves alternate, narrow. Panicle terminal.

M. VIRGI'NICUM.

Leaves linear-lanceolate; *panicle* pyramidal; *segments of the perianth* suborbicular, hastate or auriculate at base. Native of wet meadows and margins of swamps. N. York. Rare. Stem 3—4 feet high, leafy. Leaves about a foot long, and an inch wide, sessile on a contracted and subclasping base. Flowers greenish yellow, becoming brown, on short pedicels, arranged in simple, alternate racemes, and together constituting a pyramidal panicle 10—15 inches in length. Lower flowers generally sterile. July, Aug.

2. ZIGADE'NUS.

Perianth deeply 6-parted, spreading, colored, each segment with 2 glands above its contracted base; stamens inserted in contact with the ovary; capsule membranaceous, 3-celled, many-seeded.

Gr. ζυγος, a pair, αδην, a gland; alluding to the glands of the segment.

Z. GLABE'RRIMUS. *Mx.*

Root bulbous; *stem* leafy; *leaves* linear, channeled, recurved; *bracts* ovate, acuminate; *segments of the perianth* acuminate. Wet meadows. N. York. Found near Rochester. *Eaton.* Stem 2—3 feet high. Lower leaves about 10 inches long; upper ones gradually diminishing, all concave and spreading. Panicle terminal, loose, consisting of several greenish white flowers. Sepals ovate-lanceolate, free from the stamens, with the 2 glands at the base of each distinct and conspicuous. June. *Zigadene.*

3. VERA'TRUM.

Flowers monœcious-polygamous; perianth deeply 6-parted, spreading; stamens 6, inserted on the receptacle; ovaries 3, united at base, often abortive; styles short; capsule 3, connate, many-seeded.

Lat. *vere, atrum,* truly black; alluding to the color of the root. Leaves alternate, plicate. Panicle terminal. Segments of the perianth sessile and without glands.

V. VI'RIDE.

Leaves broad-oval, acuminate; *panicle* compound, racemose; *bracts* oblong-lanceolate, bracteoles longer than the downy pedicels. A large-leaved, coarse-looking plant, of our meadows and swamps. Root large, fleshy, with numerous long fibres. Stem 2—4 feet high, striate and pubescent. Leaves strongly nerved and plaited, the lowest near a foot long and half as wide, sheathing at the base. Flowers numerous, green, in many axillary (or bracted) racemes which together form a very large, pyramidal, terminal panicle. July. The root is emetic and stimulant, but poisonous, and should be used with caution. When powdered it causes violent sneezing. *Poke-root. American Hellebore.*

4. HELO'NIAS.

Perianth 6-parted, spreading, petaloid, the segments sessile and without glands; styles 3, distinct; capsule 3-celled, 3-horned; cells many-seeded.

Gr. ἕλος, a marsh, where some species grow. Lvs. mostly radical, narrow, often gramineous, sheathing at base. Fls. in a terminal, simple raceme.

H. DIOI'CA. *Ph.* Veratrum luteum. *L.*

Stem leafy; *leaves* lanceolate, radical ones oblanceolate; *raceme* spiked, nodding, diœcious; *pedicels* short, without bracts; *stamens* exserted; *segments* linear. In low grounds. Root premorse. Stem or scape 12—30 inches high, furrowed. Radical leaves 4—8 inches long, ½—1 inch wide, in a sort of whorl at the base of the scape. Flowers small, very numerous, greenish white, in long, terminal, spicate racemes which are more slender and weak on the barren plants. Ovaries as long as the linear petals, subtriangular. Capsule 3-furrowed, oblong, tapering to the base, opening at the top. The fertile plants are taller, more erect, but with fewer flowers. Jn. *Unicorn-root.*

5. TRI'LLIUM.

Perianth deeply 6-parted, in 2 distinct series, outer of 3 sepals, inner of 3 colored petals; stamens nearly equal; stigmas sessile, distinct or approximate; berry 3-celled; cells many-seeded.

Lat. *trilix*, triple; because the sepals, petals, carpels, cells, stigmas and leaves are in 3s. Stem simple. Leaves reticulate-palmate-veined. Flowers solitary, terminal.

1. T. ERE'CTUM. *L.* T. atropurpureum. *Curt.*

Leaves rhomboidal, acuminate, sessile; *peduncle* inclining; *flower* nodding; *petals* scarcely longer, but much broader than the sepals. A conspicuous plant in woods, of fine appearance, but of an intolerably offensive odor. At the top of the stem, which is a foot high, is a whorl of 3 leaves which are 3-nerved, 3—5 inches long, of equal width, and a single, nodding flower, on a nearly *erect* peduncle. Petals broad-ovate, an inch long, twice as wide as the sepals and of a dusky purple, greenish outside. May. *Bath Flower.*

β. album; flowers white and much smaller.

2. T. ERYTHROCA'RPUM. *Mx.* T. pictum. *P.*

Leaves ovate, acuminate, rounded at base, abruptly petioled; *peduncle* erect; *petals* lanceolate-ovate, recurved, twice as long as the sepals. A beautiful flower, adorning our woods in May and June. Stem 8—12 inches high, with a whorl of 3 broad-ovate leaves at top. These are 3-nerved, rounded at base, long acuminate, 3—4 inches long, ⅔ as wide, petiole 1—2 lines long. Flower nearly erect. Petals wavy at the edges, white, finely radiated with purple lines at base. The root is considered medicinal. *Smiling Wake-robin.*

3. T. CE'RNUUM.

Leaves suborbicular-rhomboidal, abruptly acuminate, shortly petiolate; *flower* cernuous, on a recurved peduncle. A large species, with a small flower. Stem slender, 10—15 inches high. Leaves 3—5 inches in diameter, nearly round, on petioles a line long. Flower white, pendulous beneath the leaves. Sepals and petals ovate-lanceolate, acuminate, flat, ¾ inch in length. Grows in thickets. N. Y. May, June. *Nodding Trillium.*

4. T. GRANDIFLO'RUM. *Salisb.*

Leaves broadly rhomboid-ovate, sessile, abruptly acuminate; *peduncle* inclined; *flower* suberect; *petals* much longer than the calyx, spathulate-oblanceolate, connivent at base. Damp, rocky woods. Abundant at Potsdam, N. Y., &c. Stem 8—12 inches high. Leaves 3—5 inches in diameter. Flower larger than in any of the preceding species. Petals 1½—2 inches in length, broadest near the apex, with a short, abrupt acumination, white, varying to rose-colored. May.

6. MEDE'OLA.

Perianth deeply parted into 6 petaloid, revolute segments; stigmas 3, divaricate, united at base; berry 3-celled; cells 3—6-seeded.

Named for the fabulous sorceress, *Medea*; for its supposed medicinal virtues. Stem simple.

M. VIRGI'NICA.

Leaves verticillate in the middle of the stem, 3 at the top. None can but admire the symmetry of its form Rhizoma white, fleshy, tuberous, resembling the cucumber in flavor. Stem erect, 1—2 feet high, invested with loose, downy wool. Leaves in two whorls, one just above the middle of the stem, consisting of 6—8 wedge-lanceolate leaves (3—4 inches long, ¼ as wide); the other at the top, of 3 ovate shorter ones. Flowers in the upper whorl, 1, 2 or 3, pendulous, with greenish, revolute segments. The stigmas are very long, reflexed, dark red. Woods. July. *Cucumber-root.*

ORDER CLVI. JUNCACEÆ. *The Rush Tribe.*

Perianth more or less glume-like, regular, 6-leaved, in 2 series (sepals and petals).
Sta.—6, rarely 3, hypogynous. *Anthers* 2-celled.
Ova.—3-carpeled, 3 (or by the dissepiments not reaching the centre 1)-celled.
Styles united into 1. *Stigmas* 3.
Fr.—Capsule 3-valved, with the dissepiments from the middle of the valves.
Seeds few or many, with a fleshy albumen.

Herbaceous plants, generally grass-like, often leafless, with small, dry, green flowers. Inflorescence cymose, capitate or fascicled. They are chiefly natives of the cool parts of the earth. Properties unimportant.

Genera.

Capsule mostly 3-celled. Seeds numerous. . . . . *Juncus.* 1
Capsule 1-celled. Seeds 3, fixed to the bottom of the cell. . . . . *Luzula.* 2

1. JUNCUS.

Perianth persistent; stamens 6; capsule mostly 3-celled; seeds numerous, attached to the inner edge of the dissepiments.

Lat. *jungo*, to join; because ropes were anciently made of these plants.

* Leaves none, or all radical.

1. J. EFFU'SUS.

Scape straight, not rigid; *panicle* lateral, loose, decompound; *capsules* obovate, obtuse. Very common in ditches and moist lands, forming tufts. Scape solid with a spongy pith, soft, striate, 2—3 feet high, bearing a very loose, spreading panicle, which protrudes from a fissure opening in the side of the stem about half way up. Flowers small, green, numerous, with 3 white anthers and yellowish seeds. June, July. *Soft Rush. Bullrush.*

2. J. SETA'CEUS. *Rosthow.*

Scape filiform, striate; *umbel* lateral, compound, few-flowered; *peduncles* compressed, several-flowered; *perianth segments* very acute. Swamps. A very slender species, growing in tufts, about 2 feet high. Scapes sheathed at base. Panicle small, 20—30 flowered, bursting from the side of the scape some distance below the summit. July.

3. J. FILIFOR'MIS. *L.* (not *Mx.*)

Creeping, leafless; *scape* slender, filiform, minutely striate, flaccid; *panicle* subsimple, lateral, near the middle of the scape; *sepals* pale, nearly equal, lanceolate, a little longer than the pale, shining, obovate, mucronate capsule. White Hills. N. H. *Green.* Scape a few inches in length.

4. J. TE'NUIS.

Stem erect, roundish, simple; *leaves* setaceous, channeled; *corymb* dense, terminal; *leaves of the calyx* acuminate, longer than the obtuse, 3-sided capsule. About foot-paths and road-sides. Stem leafy at the base, about 8—12 inches high, with a long, leafy involucre at top investing the corymb. July. *Slender Rush.*

* * Stem leafy. Leaves subcylindrical, nodose-articulate.

5. J. NODO'SUS. *L.* J. polycephalus. *Mx.*

Stem leaves subcompressed; *panicle* terminal, decompound; *heads* globose, dense, 10—15 flowered; *sepals* subequal, lanceolate, rigid, very acute, about equaling the oblong-lanceolate, acute, triquetrous, shining capsule; *segments* 3—6. In boggy meadows. Stem 1½—2 feet high. Leaves thick, jointed by internal transverse partitions. Heads resembling small burrs, some sessile, others pedunculate. Leaflets of the perianth produced into a short cusp or awn. Aug. Sept.

β. heads mostly but 2, one of them lateral and pedunculate, the other sessile. Plant slender, 8—12 inches high.

6. J. ACUMINA'TUS. *Mx.*

Stem erect; *leaves* terete; *panicle* terminal, compound; *heads* 3—6-flowered, both pedunculate and sessile; *leaflets of the perianth* linear-lanceolate, mucronate, shorter than the acute capsule. Very common in boggy meadows. Stem 12—18 inches high, tough and wiry. Leaves few and short, with knot-like joints. Panicle erect. Aug.

* * * Stems leafy. Leaves nearly flat, channeled above.

7. J. BULBO'SUS.

Stem simple; *leaves* linear-setaceous; *panicle* terminal, compound, subcymose, shorter than the involucre; *perianth segments* obtuse; *capsule* longer than the calyx, subglobose. Grows in salt marshes, forming tufts. It has a blackish appearance at a distance from its dark green foliage and dark-colored spikes. Stem 8—12 inches high, wiry. Leaves short. Panicle small, terminal, dichotomous, subtended by an involucre of 2, setaceous, unequal leaves. Aug. *Black Grass.*

8. J. BUFO'NIUS.

Stem dichotomous above; *leaves* grooved, subsetaceous; *flowers* oblong, subsolitary, sessile, unilateral. A small, caespitose species, common in wet grounds, ditches, &c. Stems numerous, 3—8 inches high, with a large, few-flowered panicle at top. Leaves few, 2—3 inches long. Perianth segments twice as long as the ovary. July, Aug. *Toad Rush.*

9. J. MILITA'RIS. *Bw.*

Leaf solitary, jointed, longer than the stem; *panicle* terminal, proliferous; *heads* about 5-flowered; *stem* thick, round, smooth, 2, 3 or 4 feet high. Leaf jointed, cylindrical, loosely cellular within, 2—3 feet long, inserted below the middle of the stem, but rising above its summit. Panicle erect, terminal, composed of several pedunculate heads each with 4—6 sessile flowers. Shores of ponds. Ms. N. H. July. *Bayonet Rush.*

10. J. TRI'FIDUS.

Stem sheathed at base; *leaf* solitary, linear-setaceous near the top; *sheaths* ciliate; *bracts* foliaceous, long, grooved. Heads about 3-flowered, terminal. White Hills. N. H. *Bw.* Stems crowded, thread-like, ½ foot high. Radical leaves 1—2, very short. The cauline leaf resembles the 2 bracts, apparently forming with them a foliaceous, 3-bracted involucre. Jl. *Three-leaved Rush.*

11. J. EMARGINA'TUS. *Rostk.*

Stem compressed; *leaves* flat, smooth, gramineous; *panicle* corymbose, simple, proliferous; *flowers* in capitate clusters, triandrous; *perianth* about as long as the obtuse capsule, the sepals and bracts somewhat awned. In low grounds. Ms. N. York. Stems 1—3 feet high. Radical leaves numerous, sheathing; cauline 1 or 2. Panicle consisting of several globose, 3—6-flowered heads both pedunculate and sessile, longer than the erect bract at base. Sepals edged with dark purple, unequal. Aug.

2. LU'ZULA.

Perianth persistent, bibracteate at base; stamens 6; capsule 1-celled, 3-seeded; seeds fixed to the bottom.

Italian *lucciola*, a glow-worm; from the dew glistening upon its flowers. Stem nodose, leafy. Lvs. flat, gramineous, generally pilose. Fls. terminal.

1. L. CAMPE'STRIS. *W.* Juncus campestris. *L.*

Leaves hairy; *spikes* terminal, with or without peduncles; *leaflets of the perianth* lanceolate, acuminate, awned, longer than the obtuse capsule. In meadows. Stem simple, straight, 3—12 inches high, according to the mois-

ture. Leaves grass-like, 2—6 inches long, very hairy at the margins. Heads in a sort of umbel, with an involucre of 2 or 3 short, unequal leaves. Perianth dark brown. An early species, flowering in May. *Field Rush.*

2. L. PILO'SA. *Willd.* Juncus pilosus. *L.*

Leaves pilose; *panicle* cymose, spreading; *flowers* solitary; *capsules* obtuse. Common in woods and groves. Stem 4—10 inches high. Radical leaves numerous, 2—4 inches long, linear-lanceolate, ribbed, fringed with long white hairs. Panicle 8—12-flowered, with a leafy bract. Pedicels about ½ inch long, finally deflexed. Perianth brown, with 2 green bracteoles. May. *Hairy Wood-rush.*

3. L. MELANOCA'RPA. *Desv.* Juncus melanocarpus. *Mx.*

Stem elongated; *leaves* sublanceolate, glabrous; *corymb* decompound; *peduncles* elongated, the branches with 3—5 pedicellate flowers; *sepals* ovate, acuminate, longer than the oval-triangular, obtuse-mucronate capsule. Native of the White Hills, N. H. *Bw.* Stem 12—18 inches high. Radical leaves 8—10 inches long, 3—5 lines wide; those of the stem much shorter, all very smooth. Panicle large, nodding, many-flowered. Capsule black. June.

4. L. SPICA'TA. *Dc.* Juncus spicatus. *Willd.*

Leaves linear, hairy at the base; *spike* cernuous, compound; *sepals* acuminate-awned, about equal in length to the subglobose capsule. White Hills, N. H. *Boott.* Stem 8—10 inches high, slender, simple. Leaves 2—3 inches long, a line wide, smooth except at the base. Spike an inch long. Aug.

ORDER CLVII. COMMELYNACEÆ. *The Spider-wort Tribe.*

Perianth in 2 series, the outer (calyx) of 3 herbaceous sepals, the inner (corolla) of 3 colored petals.
Sta.—6, some of them usually deformed or abortive, hypogynous.
Ova.—2—3-celled, cells few-ovuled. *Styles* and *stigmas* united into one.
Fr.—Capsule 2—3-celled, 2—3-valved; cells often but 2-seeded, with loculicidal dehiscence.
Seeds few, with dense, fleshy albumen. *Embryo* opposite the hilum.

Herbs with sheathing leaves, often gramineous. Of little importance.

TRADESCA'NTIA.

Sepals persistent; petals large, suborbicular, spreading; filaments clothed with jointed hairs; anthers reniform.

Named in honor of John Tradescant, gardener to Charles I.

T. VIRGI'NICA.—Erect, branching; *leaves* lanceolate, elongated, glabrous. Flowers in a clustered umbel, terminal. Native of Virginia. Leaves numerous, 1—1½ feet long, tapering from base to point, smooth. Stem thick, round, jointed, with a leaf at each joint, and two at the base of the umbel. Flowers large, of a deep blue color, soon fading. When wounded, the plant exudes a viscid juice which spins into thread; hence the common name. May—Aug. *Spider-wort.*

ORDER CLVIII. XYRIDACEÆ.

Perianth 6-parted, in 2 series, sepals 3, glumaceous, petals 3, unguiculate.
Sta.—6, 3 of them with extrorse anthers and inserted on the claw of the petals, the other 3 abortive filaments.
Ova.—Single. *Style* trifid. *Stigmas* obtuse, lobed.
Fr.—Capsule 3-valved, 1-celled with parietal placentæ, or 3-celled.
Seeds numerous, albuminous.

Rush-like herbs, with linear or ensiform, radical leaves. Flowers capitate, at the top of a simple scape. Of no known use.

XYRIS.

Heads of flowers ovoid-cylindric; sepals cartilaginous; petals equal, ovate, crenate, with narrow claws as long as the sepals; capsule 1-celled, with parietal placentæ.

Gr. ξυρος, acute-pointed; in allusion to the form of the leaves.

1. X. CAROLINIA'NA. *Lam'k.* X. Jupacai. *Mx.*

Leaves linear, gramineous; *scape* ancipitous; *head* ovoid, subacute; *bracts* orbicular. Meadows. Root bulbous, with long, white fibres. Leaves a few inches in length, often spiral, obtuse. Scape about a foot in hight, a little twisted, broader near the top, simple, bearing a roundish head of bracts and sepals, with a few yellow corollas successively developed upon it. Bracts roundish, rigid, concave, longer than the sepals, covering the fruit, the lower ones empty. Aug. *Yellow-eyed Grass.*

2. X. BREVIFO'LIA. *Mx.*

Leaves ensiform-subulate, compressed, short; *head* ovoid-globose; *calyx* longer than the bracts, somewhat gash-toothed. Boggy meadows. Stem slender, round, simple, 12—18 inches high. Leaves narrow, 2 inches long, twisted. Heads not larger than a pea. Flowers yellow. Aug.

ORDER CLIX. ERIOCAULONACEÆ. *The Pipe-wort Tribe.*

Fls.—Monœcious or diœcious, in a dense head. *Perianth* 2—6-parted, or wanting.
Sta.—6, some of them generally abortive. *Anthers* mostly 1-celled.
Ova.—1 or more-celled, cells 1-seeded. *Seeds* pendulous.

Chiefly South American herbs, of aquatic habit, with cellular or fleshy leaves. They are of no known use.

ERIOCAU'LON.

Flowers monœcious, collected into an imbricated head; involucre many-leaved. *Sterile* in the disk; perianth single, 3-cleft, the 2 inner segments united nearly to their summit; stamens 4—6. *Fertile* in the margin; perianth single, deeply 4-parted; style 1; stigmas 2 or 3; capsule 2—3-celled, 2—3-lobed; cells 1-seeded.

Gr. εριον, wool, καυλος, a stem; the stem being sometimes velvety with down.

1. E. SEPTANGULA'RE. *With.* E. pellucidum. *Mx.*

Smooth; *scape* slender, about 7-furrowed; *leaves* linear-subulate, pellucid, channeled, 5-nerved; *head* small, globose; *scales of the involucre* obtuse. A small plant of simple structure, in water, only the scape arising above the surface. Leaves radical, submersed, in a small tuft at the bottom, 1—3 inches long, 1—2 lines wide, tapering to a point, transparent at base. Stem simple, erect, 4—12 inches high, with a small, terminal, hemispherical head of close, white flowers. June. *Pipe-wort.*

2. E. GNAPHALOI'DES. *Mx.*

Scape somewhat compressed, with 10 furrows; *leaves* short, subulate, ensiform, glabrous; *heads* hemispheric-convex; *involucre* of shining, scarious, oval, round-obtuse scales. In still waters. Scape 10—14 inches high. July. *Gnaphalium-like Pipe-wort.*

CLASS IV. GLUMACEOUS ENDOGENS.

Flowers with glumes; or floral organs enclosed in imbricated bracts, and arranged in spikelets, having no proper perianth (calyx or corolla). Ovary with one cell containing a solitary ovule and becoming a one-seeded fruit (achenium or caryopsis).

ORDER CLX. CYPERACEÆ. *The Sedge Tribe.*

Fls.—Perfect or monœcious, solitary in the axil of each bract (glume, scale).
Per.—Wanting, or only represented by a few hypogynous bristles (setæ).
Sta.—Definite (1—12), mostly 3. *Anthers* fixed by their base, entire, 2-celled.
Ova.—Generally either surrounded by *setæ* (rudimentary perianth), or invested in a sac (perigynium) composed of united bracteoles. *Ovule* erect.
Sty.—2 or 3, more or less united. *Stigmas* undivided, rarely bifid.
Fr.—An achenium. *Embryo* in the end of the albumen next the hilum.

A large order of coarse, grass-like, cæspitose plants. Root fibrous. Stem (often called *culm*) usually solid with pith, generally without joints or nodes, and triangular. Leaves with their sheaths entire. The sedges abound in almost all countries and climes of the globe and in all localities, but are more common in the meadows, marshes and swamps of the temperate zones About 15 genera and 250 species are known in North America.

Properties. They are in general little used for food or in the arts. Their coarse herbage is often eaten by cattle, but they are nearly destitute of the sweet and nutritious properties of the grasses. The leaves of some of the larger species are used in Italy to bind flasks, and in weaving the bottoms of chairs. Yet, although of so little apparent value, their vast numbers authorize the belief that they subserve many highly important ends in the economy of nature.

Conspectus of the Genera.

Ovary not enclosed. Inflorescence	all terminal.		Setæ none.	Stem naked. Style bifid.	*Scirpus.* § 5.	5
				Stem naked. Style trifid.	*Scirpus.* § 4.	5
				Stem leafy.	*Schœnus.*	8
			Setæ 3—6.	Umbels cymose.	*Scirpus.* § 2.	5
				Spikelets several, awned.	*Fuirena.*	4
				Spikelet solitary.	*Scirpus.* § 3.	5
	all lateral upon a leafless stem.	Glumes imbricated all around.	Setæ numerous, long, white.	*Eriophorum.*	6
			Spikelets distinct.	*Cyperus.*	1
		Glumes imbricated in 2 rows.	Spikelets in dense heads.	*Mariscus.*	2
				Scirpus. § 1.	5
	both lateral and terminal.	Flowers perfect.	Glumes imbricated all around.	*Rhinchospora.*	7
			Glumes imbricated in 2 rows.	*Dulichium.*	3
		Fls. monœcious.	Spikelets fascicled. Seed bony.	*Scleria.*	9
Ovary enclosed in a ventricose sac (perigynium). Flowers monœcious.				*Carex.*	10

Tribe 1. CYPERACEÆ *veræ.*

Flowers perfect or monoclinous. Spikelets distichous, that is, with the glumes imbricated in 2 rows.

1. CYPE'RUS.

Spikelets compressed, distinct, many-flowered; glumes imbricated in two, opposite rows, nearly all with a flower enclosed; ovary generally without setæ. Mostly perennial.

1. C. STRIGO'SUS. *Bristle-spiked Galingale.*
Stem triquetrous, leafy only at base; *leaves* broad-linear, rough-margined, about as long as the stem; *umbel* with elongated rays and oblong, loose spikes; *spikelets* numerous, linear-subulate, spreading horizontally, 10—12-flowered; *involucre* of about 6 leaves, the 2 outer ones very long. Wet grounds. Stem 1—2 feet high, bulbous at base. Umbel yellowish. Sept.

2. C. REPENS. *Ell.* C. phymatodes. *Muh.*
Root creeping, bearing small, round tubers at the extremities; *stem* 1—2 feet high, 3-angled, striate; *leaves* subradical, as long as the stem; *umbel* 4—6-rayed; *rays* often branched, bearing linear, obtuse spikelets somewhat in 2 rows. Moist fields. N. Y. Very similar to the last. Aug.

3. C. NUTTA'LLII. *Torr.* C. cæspitosus. *Spreng.*
Stem acutely triquetrous, leafy at base; *leaves* narrow-linear, nearly as high as the stem; *umbel* loose, subsessile, about 3-rayed; *rays* short; *involucre* 4-leaved, the 2 outer leaves very long; *spikelets* very acute, linear-lanceolate, fasciculate, brownish; *ach.* oblong-obtuse. Marshes. Sept.

4. C. DIA'NDRUS. *Torr.* C. bicolor. *Bart.*
Stem slender, reclining; *umbels* sessile, 1—2-rayed; *rays* unequal; *involucre* 3-leaved, the 2 outer leaves very long; *spikelets* oblong-lanceolate, flat, 14—16-flowered, collected into capitate fascicles; *glumes* acute; *stamens* 2; *style* 2-cleft; *ach.* compressed. Marshes. Stem 8—12 inches long. Umbel somewhat paniculate. Glumes chestnut-colored. Sept.

5. C. POŒFO'RMIS.
Stem slender, 3—6 inches high; *corymb* fascicled; *fascicles* both sessile and peduncled; *involucre* of 3 very long leaves; *spikelets* oblong, flattened, reddish brown. Abounds in cold, wet, sandy places and road sides, forming dense, turfy masses. July.

6. C. FLAVE'SCENS. *Yellow Sedge.*
Stem leafy, triquetrous; *spikelets* linear-lanceolate, 15—20-flowered, in fascicles of 3 or 4; *involucre* of 3, unequal leaves, longer than the spikes; *glumes* ovate, obtuse; *style* 2-cleft; *achenium* mucronate, somewhat rugose, dark brown. A common sedge, about 8 inches high, in marshy grounds, with yellowish green spikes in a terminal umbel with unequal rays. Aug. Sept.

7. C. DENTA'TUS. *Torr.* *Dentate Sedge.* C. parviflorus. *Muh.*
Stem leafy at base, triquetrous; *umbel* compound, 6—10-rayed; *involucre* of 3 unequal leaves, longer than the umbel; *spikelets* 3 on each peduncle, ovate, flat, 8-flowered; *glumes* acute, spreading at the points like teeth; *styles* 3-cleft; *ach.* triangular. Marshes. Stem about a foot high. Sept.

8. C. INFLE'XUS *Mx.* C. uncinatus. *Ph.*
Stem setaceous, leafy at base, 2—3 inches high; *leaves* equaling the stem; *umbel* 2—3-rayed, or conglomerate and simple; *involucre* of 3 long leaves; *spikelets* oblong, 8—12-flowered, 10—20 together, densely crowded into the ovoid heads; *glumes* yellowish, nerved, squarrose-uncinate at tip; *stamen* 1. Banks of streams. Aug. Sept.

9. C. MARISCOI'DES. *Ell.* C. filiculmis. *Vahl.*
Stem slender, 8—12 inches long, leafy only at base; *leaves* mostly radical, carinate; *umbel* simple and sessile, or with 1 or 2 rays; *spikelets* linear-lanceolate, 3—8-flowered, flattened when old, collected into globose heads; *glumes* remote, loose, ovate, yellowish. Dry, rocky hills. Aug.

2. MARI'SCUS.

Spikelets few-flowered, clustered in heads; glumes imbricate somewhat in 2 rows, the lower ones short and empty; stamens sometimes 2; style trifid; fruit triquetrous, naked.

1. M. OVULA'RIS.

Stem triangular, nearly naked, about a foot high; *leaves* shorter than the stem, nearly smooth; *umbel* simple; *rays* short; *heads* 1—5, globose, middle one sessile, the rest on the spreading rays; *involucre* 4—5-leaved, unequal, 2 of them much longer than the rest. Bogs and low grounds. Aug.

β. tenella (Torr.); *stem* slender, acutely triangular; 3 of the involucrate leaves much longer than the umbel.

2. M. RETROFRA'CTUS.

Stem triangular, naked, about 2 feet high; *leaves* linear-lanceolate, half as long as the stem; *umbel* simple; *rays* long, unequal, 6—8; *involucre* 3-leaved, shorter than the rays; *spikelets* subulate, retrorsely imbricated into obovate spikes. Wet grounds. Aug.

3. DULI'CHIUM.

Spikes axillary, racemose; spikelets linear-lanceolate, subcompressed; glumes sheathing, closely imbricated in 2 rows; style long, bifid, the persistent base crowning the compressed achenium; ovary invested with setæ.

D. SPATHA'CEUM.

Stem round, leafy and somewhat 3-sided above, thick, sheathed below; *leaves* alternate, pointing 3 ways, 2—4 inches long, 3 lines wide; *sheaths* tubular, shorter than the internodes; *spikes* axillary from within the sheaths and terminal, each consisting of 8—10 linear-lanceolate, alternate spikelets in 2 rows; *spikelets* 5—7-flowered, nearly an inch in length; *glumes* linear-lanceolate. Aug. Per.

TRIBE 2. SCIRPEÆ.

Flowers perfect or monoclinous. Spikelets with the glumes imbricated all around.

4. FUIRE'NA.

Glumes awned, imbricated on all sides into a spike; petaloid scales 3, cordate, awned, unguiculate, investing the achenium.

F. SQUARRO'SA. *β. pumila. Torr.*

Stem pubescent above, 3—6 inches high; *leaves* linear-lanceolate, flat, striate, as long as the stem; *spikes* 1, 2 or 3, thick, subtended by 2—3 long, involucrate, unequal leaves; *glumes* ovate-lanceolate, with short awns; *petaloid scales* ovate-lanceolate; *achenium* pedicellate, with retrorsely hispid setæ. Wet, sandy places. Aug.

5. SCIRPUS.

Spikelets ovoid, many-flowered, with glumes imbricated all around; ovary sometimes naked, but commonly invested with setæ or long hairs.

§ 1. Ovary invested with hypogynous setæ. Style bifid, deciduous. Setæ straight, distinctly hispid. Spikelets subterminal or lateral. SCIRPUS *verus*.

1. S. TRI'QUETER. *Mx. Triangular Club-rush.* S. Americanus. *Pers.*

Stem nearly naked, 3-angled, corners acute and two of the sides concave, about 3 feet high and ending in a sharp point; *leaves* few and short, from the top of the sheath; *spikes* lateral, 1—5, ovate, crowded and sessile, at various distances below the point; *glumes* round-ovate mucronate; *bristles* 6. Ponds and marshes, fresh and salt. July.

2. S. DE'BILIS.

Stem cæspitose, roundish, deeply striate, 9—16 inches high, with a few subulate leaves at base; *spikelets* about 3, short-ovoid, sessile, crowded, subterminal; *glumes* ovate, obtuse, carinate, pale-green; *achenium* obovate, mucronate; *bristles* 4—5. Borders of ponds. Aug.

3. S. LACU'STRIS. S. acutus. *Muh.*

Scape smooth, leafless, filled with a porous pith, 5—8 feet high, cylindric, tapering above the panicle, and abruptly ending in a short cusp; *panicle* cymose near the top; *peduncles* rough, twice compound; *spikelets* ovoid, closely imbricate; *scales* ovate, mucronate, pubescent; *bracts* shorter than the panicle. The largest species of bullrush, frequenting the muddy margins of rivers and ponds. July.

§ 2. Ovary invested with tortuous, capillary, scarcely hispid setæ. Style 3-cleft, not bulbous at base, deciduous. Spikelets numerous, terminal, in cymes or panicles. Stem leafy. TRICHOPHORUM.

4. S. ATROVI'RENS. *Muh.*

Stem obtusely triangular, leafy, 2 feet high; *cyme* terminal, compound, proliferous; *involucre* of 3 leaf-like bracts, longer than the cyme; *spikes* ovate, acute, crowded, 10—20 in a globose head; *heads* numerous, ½ inch in diameter, dark green; *glumes* ovate, mucronate; *achenium* white, smooth; *bristles* 4. Common in wet meadows. June, July.

5. S. BRU'NNEUS. *Muh.*

Stem obtusely triangular, leafy, 2—3 feet high; *cyme* decompound, its principal branches about 5, unequal, with truncate sheaths at base; *spikelets* clustered in heads of 3—6; *glumes* obtuse, reddish brown; *achenium* smooth, yellowish white, shorter than the 4 or 5 tortuous bristles. Much resembles the last species. Margins of waters. Rare. Aug. Sept.

6. S. MARI'TIMUS.

Stem acutely 3-angled, leafy, 2—3 feet high; *leaves* broad-linear, rough-edged, carinate, taller than the stem; *spikes* conglomerate, 6—10, nearly an inch long, corymbose; *involucre* of about 3 very long leaves; *glumes* ovate, 3-cleft, the middle segment subulate and reflexed; *style* 3-cleft; *bristles* 4. Salt marshes. Aug.

7. S. ERIO'PHORUM. *Mx.* Trichophorum cyperinum. *Pers.*

Stem obtusely triangular, leafy, 3—5 feet high; *leaves* 2 feet long, rough-edged; *panicle* umbellate, decompound, large and loose; *bristles* 6, capillary, curled, very conspicuous, being 5 or 6 times as long as the white achenium. A common, stiff, rank meadow grass, which cattle do not eat. Spikelets numerous, small, ovoid, obtuse, in small clusters. Involucre 4-leaved. Aug.

8. S. LINEA'TUS. *Mx.* Trichophorum lineatum. *Pers.*

Stem triangular, very leafy, 2—3 feet high; *panicles* terminal and axillary, decompound, at length nodding; *involucre* of 1—2 bracts, longer than the leaves; *spikes* ovoid, pedunculate, solitary; *glumes* lanceolate, ferruginous; *bristles* 6, as long as the glumes. Swamps. Aug.

§ 3. Ovary invested with setæ. Style 2—3-cleft, articulated to the achenium, with a dilated or bulbous, persistent base. Spikelet solitary, terminal. Setæ straight, retrorsely hispid. ELEOCHARIS.

9. S. TE'NUIS. *Slender Club rush.*

Stem leafless, almost filiform, quadrangular, the sides sulcate, 8—15 inches high, with a long, purple sheath at base; *spike* terminal, elliptic-oval, acute at each end; *glumes* dark purple, ovate, obtuse, the lower ones larger and empty; *ovary* roundish, tapering below, invested with 2 or 3 or 0 setæ. Common in wet places. June, July.

10. S. PALU'STRIS. *Marsh Club rush.*

Stem leafless, round, inflated; *spikelets* smooth and shining, lance-oblong, acute, often oblique, terminal; *glumes* subacute, the lower ones larger, sometimes empty. Wet grounds. Root creeping. Stems numerous, 1—2½ feet

high, each with an obtuse sheath at the base. Achenium roundish-obovoid, rugose, punctate, surrounded with 3 or 4 scabrous bristles, and crowned with a tubercle. July.

11. S. OBTU'SUS. *Willd.* *Headed Club-rush.* S. capitatus. *Muh.*

Stem sulcate, subterete, 6—15 inches high; *spikelet* ovoid, very obtuse, often nearly globose; *glumes* round, dark brown, with whitish margins; *achenium* obovate, compressed, smooth, brown, invested with 6 setæ as long as the glumes. Shallow waters. July.

12. S. ACICULA'RIS. *L.* S. trichodes. *Muh.* S. capillaceus. *Mx.*

Stem leafless, setaceous, quadrangular, very slender, 3—6 inches high; *spikelets* oblong-ovate, acute, 4—8-flowered; *glumes* obtusish, the lowest one larger and empty; *achenium* obovoid, triangular, verrucose, yellow and shining. Shallow waters. July. *Hair Club-rush.*

13. S. INTERME'DIUS. *Turf Club-rush.*

Stem slender, declining, quadrangular, furrowed, cæspitose, 2—3 inches long; *spike* ovate-oblong; *glumes* acute, dark brown; *style* 2-cleft; *achenium* broad-obovate, compressed; *tubercle* minute, distinct; *bristles* 6, longer than the fruit. In running water, forming strong, dense turf. July.

14. S. PLANIFO'LIUS. *Flat-leaved Club-rush.*

Stem cæspitose, leafy at base, acutely and roughly 3-angled, 5—10 inches high; *leaves* broad-linear, flat, rough on the margin, equaling the stem; *spike* oblong-lanceolate, compressed, terminal, 4—8-flowered; *glumes* ovate-mucronate, yellowish; *bracts* at the base of the spike, cuspidate, outer ones longer than the spike; *achenium* reddish brown, invested with 6 bristles longer than itself. In cold, hard soils. June.

15. S. CÆSPITO'SUS. *Scaly Club-rush.*

Stems cæspitose, round, sheathed at base with numerous rudiments of leaves; *spikes* compressed, terminal; 2 *lower glumes* involucre-like, as long as the spike; *ach.* with 6 bristles. Grows in dense tufts, 4—12 inches high. Spike 4—5-flowered, reddish brown. On the White Mts., N. H. *Bw.* July.

16. S. SUBTERMINA'LIS. *Torr.*

Stem floating, furrowed, inflated, leafy below, 3 ft. long; *leaves* very narrow; *spike* solitary, somewhat terminal (the stem being continued above it in the form of a bract), lanceolate; *style* 2-cleft; *bristles* 6. Streams, &c. Mass. Aug.

17. S. TUBERCULO'SUS. *Mx.*

Stem columnar, striate, 12 inches high, leafless, sheathed at base; *spikelet* ovate-lanceolate; *glumes* very obtuse, loose; *ach.* somewhat triquetrous, smaller than the sagittate tubercle with which it is crowned; *bristles* 6, as long as the tubercle. Sandy swamps. Mass. July.

§ 4. Ovary destitute of setæ. Achenium 3-angled. Style trifid, not ciliate, bulbous at base. Glumes carinate, somewhat 4—8-ranked. Inflorescence terminal. TRICHELOSTYLIS.

18. S. CAPILLA'RIS.

Stem cæspitose, nearly naked, 3-angled, capillary, 4—8 inches high; *leaves* subradical, setaceous, shorter than the stem; *spikelets* ovoid, 2—4, pedunculate, inner one sessile; *glumes* oblong, ferruginous, margin pubescent; *ach.* white. In sandy fields. Aug.

19. S. AUTUMNA'LIS.

Stem compressed, 2-edged, cæspitose, leafy at base, 3—10 inches high; *leaves* flat, linear, shorter than the stem; *umbel* compound; *involucre* 2-leaved; *spikelets* lanceolate, acute, somewhat 4-sided, 2—3 together; *glumes* brown, mucronate; *achenium* white. Wet places. July.

§ 5. Ovary destitute of setæ. Achenium compressed. Style bifid, ciliate, bulbous at base. FIMBRISTYLIS.

20. S. SUBSQUARRO'SUS. *Muh.* S. minimus.

Scape triangular, incurved, nearly naked, but 2 or 3 inches high; *spikelets* nearly terminal, ovoid, about 3; *involucre* of 2 long, unequal leaves; *glumes*

somewhat squarrose at the tip. A minute, cæspitose rush, with setaceous leaves and stems, on sandy banks Aug.

21. S. BALDWINIA'NUS. *Schult.* Fimbristylis ferruginia. *Vahl.*

Stem compressed, deeply striate, leafy at base; *umbel* mostly simple, 3—4-rayed, central spikelets sessile; *involucre* subulate, 2-leaved, as long as the umbel; *spikelets* ovoid, acute; *glumes* ovate, brown; *style* bifid, cihate; *achenium* white, longitudinally furrowed. Swamps. July.

6. ERIO'PHORUM.

Glumes imbricated all around into a spike; achenium invested in very long, dense, woolly or cottony hairs.

* Spikelet solitary.

1. E. ALPI'NUM.

Stem acutely 3-angled, naked, somewhat scabrous, 8—10 inches high, with 3—4 radical sheaths; *radical leaves* very short, subulate; *spikelet* oblong, about 2 lines in length; *setæ* 6 to each flower, woolly, white, crisped, 3 times as long as the spike. Bog meadows. July.

2. E. VAGINA'TUM. E. cæspitosum. *Host.*

Stems densely cæspitose, obtusely triangular, very slender, smooth and rigid, about a foot high; *uppermost sheaths* inflated; *spikelet* ovate, oblong, 6—8 lines long, of a blackish color, with scarious glumes; *setæ* 15—20 to each flower, straight, white, and glossy, twice as long as the spikelet, conspicuous, as well as in other species, even at a distance among the meadow grass. Jn. Jl.

* * Spikelets numerous.

3. E. POLYSTA'CHYON.

Stem somewhat triangular, smooth, 1—2 feet high; *cauline leaves* 2—3, broad-linear, flattened below, triquetrous at the end; *spikelets* about 10, on rough peduncles which are long and drooping and sometimes branched; *setæ* 30—40 to each flower, reddish white, 6—8 lines long. Very conspicuous in meadows and swamps. July.

4. E. ANGUSTIFO'LIUM. *Rich. Narrow-leaved Cotton grass.*

Stem slender, leafy, smooth, 10—15 inches high; *cauline leaves* narrow, 3-cornered, with concave sides, 1—3 inches long; *involucre* of one bract, with a loosely sheathing base; *spikelets* 2—4, on short peduncles, nodding; *setæ* 40—50 to a flower, long, white and cottony. Swamps. July.

5. E. VIRGI'NICUM. *Virginian Cotton grass.*

Stem nearly round, leafy, smooth, 2—3 feet high; *leaves* flat, few, long, with scabrous margins; *involucre* 2—4-leaved, outer leaves much longer; *spikelets* in a sort of umbel, erect, nearly sessile; *glumes* ovate, brown at the sides; *keel* green; *hairs* 50—60, reddish white, long and cottony. Wet grounds. July.

7. RHYNCHOSPO'RA.

Spikelets few-flowered; glumes imbricated all around, lower ones empty; achenium invested with hypogynous setæ, and crowned with the persistent, enlarged, conical base of the style.

1. R. ALBA. *Vahl. White Bog-rush.* Schœnus albus. *L.*

Stem triangular above, very slender, leafy, smooth, 10—16 inches high; *leaves* setaceous, channeled; *corymbose fascicles* pedunculate, both terminal and from the axils of the sheaths, with setaceous bracts; *spikelets* lanceolate, acute at each end, with crowded, lanceolate, white glumes. In wet, shady grounds; common. July—Sept.

2. R. GLOMERA'TA. *Vahl.* Schœnus capitellus. *Mx.*
Stem slender, smooth, leafy, a foot or more high; *leaves* flat, carinate, rough-edged; *corymbed fascicles* very remote, in pairs, axillary and terminal; *spikelets* lanceolate; *glumes* keeled, mucronate, brown; *achenium* obovoid or cuneiform, very smooth, as long as the tubercle; *setæ* 6, rough, backwards. In bogs. July. Aug.

3. R. FUSCA.
Stem 3-angled, about 2 feet high; *leaves* linear, carinate, smooth; *fascicles* alternate, pedunculate; *bracts* setaceous, longer than the ovoid spikes; *glumes* brown, ovate; *achenium* brown, rugose, with an acute, black tubercle as long as the hispid bristles. Wet places. Rare.

4. R. MACROSTA'CHYA. *Torr.* Ceratoschœnus. *ejusd.*
Axillary corymbs subsimple, *terminal ones* compound; *upper spikelets* densely fascicled; *ach.* ovate, smooth; *bristles* erectly hispid, twice as long as the achenium; *style* persistent, nearly 4 times as long as the achenium. Mass.

8. SCHŒNUS.

Spikelets subconvolute, acute; glumes imbricated all around, the lower ones empty and dry; ovary roundish, without setæ.

S. MARISCOI'DES. *Bog rush.*
Stem terete, leafy, 1—2 feet high; *leaves* channeled above, rounded beneath; *umbel* terminal; *fascicles of spikelets* 3 on each peduncle, 10—15 spikelets in each; *glumes* brown, ovate; *achenium* rounded at base, crowned with the remains of the style. Bogs. Mass. N. Y. July.

TRIBE 3. SCLEREÆ.

Flowers monœcious or diclinous. Achenium naked (without a perigynium), more or less hard and bony.

9. SCLE'RIA.

Flowers monœcious. *Sterile.*—Glumes 2 or 6, many-flowered; paleæ (inner glumes) awnless. *Fertile.*—Glumes 2 or 6, 1-flowered, paleæ 0; stigmas 1—3; achenium colored, subglobose.

S. TRIGLOMERA'TA. *Muh.* *Whip grass.*
Stem erect, acutely triangular, rough, leafy, 3—4 feet high; *leaves* linear-lanceolate, rough-edged; *spikelets* lateral and terminal, alternate, in about 3 subsessile fascicles, and much shorter than the leafy bracts; *glumes* ovate, cuspidate, dark purple; *achenium* globose, smooth and polished, white. Swamps. Mass. June, July.

TRIBE 4. CARICEÆ.

Flowers monœcious, rarely diœcious. Spikelets with the glumes imbricated all around. Achenium enclosed in a persistent, ventricose sac, called perigynium, which is analogous to a perianth.

10. CAREX. *L.* *

Spikelets one or more, either androgynous (with both staminate and pistillate flowers), or with the two kinds in separate

* By Rev. Chester Dewey, D. D. *See Preface.*

spikelets, rarely diœcious; glumes single, 1-flowered, lower ones often empty; stamens 3; stigmas 2 or 3; perigynium of various forms, 1-valved, persistent, enclosing the lenticular or triangular achenium.

I. STIGMAS TWO. ACHENIUM DOUBLE CONVEX.

A. SPIKE SINGLE. 1. MONŒCIOUS.

1. C. CAPITATA. *L.*

Spike capitate or nearly globose, staminate at the summit; *fruit* (*perigynium*) roundish-ovate, close, compressed, convex-concave, glabrous, acutish, longer than the ovate and rather obtuse glume; *leaves* slender. Alpine regions of the White Mts. *Robbins.*

A. SPIKE SINGLE. 2. DIŒCIOUS.

2. C. DAVALLIANA. *Smith.*

Spike oblong, rather loose flowered; *perigynium* ovate-lanceolate, attenuate, convex, terete, recurved, longer than the ovate glume; *stem* and *leaves* are usually serrulate. Wayne Co., N. Y. *Sartwell.*

3. C. EXI'LIS. *Dewey.*

Fertile spike staminate below, ovate, rather densely flowered; *perig.* ovate-lanceolate, convex on both sides, diverging, serrulate on the margin, a little longer than the ovate, acute glume; *leaves* setaceous; *stem* 12—20 inches high. Grows in Danvers and Ipswich, Ms.—*Oakes;* in N. Y and N. J. May.

β. squamacea (D.); spike often an inch long, having many staminate glumes at the base and few *perig.* at the summit; longer than the other, and grows with it in Ipswich, Mass. *Oakes.*

B. SPIKES SEVERAL, ANDROGYNOUS.

1. *Stamens variously situated—above, below, or in the middle; sometimes diœcious.*

4. C. STE'RILIS. *Willd.*

Spike compound, staminate below, often diœcious; *spikelets* 4—6, ovate, subapproximate; *perig.* ovate, acuminate, or subrostrate, bifid, compressed, triquetrous, scabrous on the margin, equaling the ovate, acutish glume; *stem* 2 feet high, erect and stiff. Wet places; common.

5. C. BROMOIDES. *Schk.*

Spikelets numerous, alternate, staminate below, sometimes all pistillate; *perig.* lanceolate, erect, acuminate, scabrous, nerved, bifid, twice longer than the ovate-lanceolate glume. Common in small bogs, in wet places.

6. C. SICCATA. *Dewey.*

Spikelets numerous, staminate above, often wholly staminate, ovate, close or approximate; *fruit* ovate, lanceolate, acuminate, compressed, nerved, bifid, scabrous on the margin, equaling the ovate and lanceolate glume. Sandy plains, Westfield, Mass. *Davis;* Ipswich, Mass. *Oakes;* widely spread over the country, but not abundant.

7. C. SARTWELLII. *Dewey.*

Spikelets 12—20, ovate, sessile, compact, bracteate, lower ones especially fructiferous; upper often staminate; *perig.* ovate, lanceolate, convexo-concave, subulate, short, 2-toothed, a little longer than the ovate and acute glume; *leaves* flat, linear, shorter than the stem. Junius, Seneca Co., N. Y. *Sartwell.*

2. *Stamens at the summit of the spikelets.*

a. Cephalous, or fruit in heads.

8. C. CEPHALO'PHORA. *Willd.*

Spikelets ovate, densely aggregated into an ovate head, bracteate, about 5; *perig.* ovate, acuminate, compressed, bifid, scabrous on the margin, with a short, ovate, and scabro-cuspidate glume which equals it; *stem* 8—16 inches high. Borders of fields and woods; common, but not abundant.

9. C. VULPINOIDEA. *Mx.* C. vulpineformis. *Tuckerman.* C. multiflora. *Muh.*

Spikelets ovate-oblong, obtuse; *spike* decompound, bracteate, conglomerate; *perig.* ovate, acuminate, densely imbricate, bifid, triply nerved, diverging, a little shorter than the ovate-cuspidate glume; *stem* obtusely triangular, round and leafy towards the base. Common in fields.

β. microsperma. (*D.* C. microsperma. *Wuhl.*); *spikelets* closely aggregated; whole spike less compact; *perig.* more convex, shorter, less acuminated into a beak, very abundant. Grows with the other, in dry and moist situations.

10. C. SETACEA. *Dewey.*

Spikelets ovate, alternate, obtuse, conglomerate, bracteate; *perig.* ovate-lanceolate, acuminate, compressed, bifid, some diverging, about equal to the ovate-lanceolate awned glume; *stem* 2 feet high, acutely triangular, scabrous above and striate. Wet places—not abundant.

11. C. MUHLENBERGII. *Schk.*

Spikelets alternate, obtuse, approximate, with a long bract at the lower one; *perig.* ovate, convex above, very smooth, nerved, bifid, scabrous on the margin, some diverging, a little shorter than the ovate and mucronate glume; *stem* 12—18 inches high. In fields, not very common, readily distinguished from the three preceding and following.

12. C. CHORDORRHIZA. *L.*

Spikelets 3—5, aggregated into a head, ovate, sessile; *perig.* ovate, acuminate, subrostrate, convex above, equaling the broad, ovate and acute glume; *stem* branching towards the base and sending out roots at the joints; *spikes* rarely bearing only stamens. Marshes. New York; common—*Sartwell.* Michigan—*Cooley.*

13. C. PRARISA. *Dew.*

Spike below branched; *spikelets* ovate, sessile, 5—7 on a branch; *perig.* ovate-lanceolate, convex both sides, scabrous on the margin, slightly bifid, equaling the ovate-lanceolate glume; *stem* 2—3 feet high, leafy towards the base. Abundant in the prairies of Michigan, and sparingly found in N. England and N. Y. Resembles *C. paniculata. L.* which has a much broader ovate glume, shorter than the perigynium and is far more paniculate, and for which this has been taken.

14. C. TERETIUSCULA. *Good.*

Spikelets ovate, acute, sessile, decompound, brownish, lower one bracteate; *perig.* ovate, acute, convex and gibbous, scabrous on the edge, spreading, longer than the ovate and acute glume; *fruit* brown; *stem* 18—36 inches high, leafy towards the root. Wet places, common, in tufts.

15. C. DECOMPOSITA. *Muhl.*

Spike decompound or paniculate; *spikelets* very many, ovate, alternate; *perig.* ovate, convex on both sides, triangular, acutish or short-rostrate, short, brownish, glabrous, about equal to the ovate and acuminate, whitish glume; *stem* 18—30 inches high. Found in swamps, Michigan, and in Yates Co., N. York. *Sartwell.*

16. C. PANICULATA. *L.*

Spike paniculate, often diœcious, long and spreading; *spikelets* ovate, sessile, 6—18 on a branch below, short bracteate; *perig.* ovate, acute, gibbous, nerved, 2-toothed, brownish or tawny, 2-toothed, serrulate on the margin, a little shorter than the broad-ovate, short-acute glume; *stem* 2 feet high. Found in Northern America, and hardly known in the United States.

b. Perigynia radiating.

17. C. RO'SEA. *Schk.*

Spikelets 3—5, subremote, sessile, alternate, stellate, even before maturity, lowest long bracteate; *perig.* oblong-lanceolate, 5—12, convex above, scabrous on the margin, 2-toothed, very diverging or even reflexed, twice as long as the ovate-obtuse glume; *stem* 8—16 inches high.

β. radiata (*Dew.*); *spikelets* distant, about 3-flowered, with setaceous bracts; *perig.* oblong, acute; *stem* 4—8 inches high, flaccid or lax, setaceous, with very narrow leaves. Common in pastures and moist woods; the variety is about woods, or open places in woods.

18. C. RETROFLEXA. *Muhl.*

Spikelets about 4, ovate, alternate, subapproximate, sessile, bracteate and stellate in maturity; *perig.* ovate, acutish, 2-toothed, subscabrous or smooth on the margin, reflexed and spreading, about equal to the ovate and acute glume; *stem* about a foot high. Readily distinguished from the preceding. Woods and pastures, not abundant.

19. C. STIPATA. *Muh.*

Spike often decompound; *spikelets* oblong, aggregated, numerous, bracteate; *perig.* ovate-lanceolate, round at the base, plano-convex, nerved, bifid, subscabrous on the margin, diverging, twice longer than the ovate-lanceolate glume; *stem* thick, acutely triquetrous, concave on the sides. Wet places and marshes, abundant.

20. C. ALOPECOIDA. *Tuckerman.* C. cephalophora, β. maxima. *Dew.*

Spike compound rather loose; *spikelets* 8—10, aggregated into an oblong head, bracteate, sessile; *perig.* ovate, plano-convex, scarcely nerved, acuminate, serrulate on the edge, bifid, subrostrate, a little longer than the ovate and acuminate glume; *stem* triquetrous, scabrous on the edges. Moist woods, Penn. and N. York. *Sartwell.*

21. C. CEPHALOIDEA. *Dew.*

Spikelets 4—6, ovate, aggregated closely, sessile and bracteate; *perig.* ovate, obtusish, bifid, scabrous on the margin, plano-convex, very diverging in maturity, about twice as long as the short, ovate, obtusish glume. Dry fields —not abundant, but common over New England and New York. In hedges it is often four feet long, and subprostrate, leafy towards the base.

22. C. SPARGANOIDES. *Muh.*

Spikelets 7—10, ovate, rather distant, bracteate, sessile; *perig.* ovate, acute, compressed, diverging, acuminate, 2-toothed, scabrous on the margin, nearly twice the length of the ovate, acute, or mucronate glume, *stem* about 2 feet high, with long, striate leaves.

β. ramea (*D.*); has one branch or more at the base, with several spikelets in the place of the lower spikelet, and is the *C. divulsa* of Pursh. About cultivated and moist fields, common.

23. C. MURICATA. *L.*

Spikelets about 5, ovate, sessile, approximate, bracteate, lower ones sometimes remotish; *perig.* ovate-lanceolate, plano-convex, 2-toothed, horizontal, scabrous on the margin, sometimes longer than the ovate-lanceolate glume. Fields near Boston, *B. D. Greene*, and common in Arctic America; Charlestown, Mass., *M. A. Curtis.*

c. Perigynia few.

24. C. DISPERMA. *Dew.*

Spikelets 3—4, erect, subapproximate, lowest bracteate; *perig.* ovate, obtuse, about two, nerved, plano-convex, short-beaked, glabrous, twice longer than the ovate, acute, submucronate glume; *stem* slender, 6—18 inches high, with narrow and linear leaves. *Perigynia* 1–2, sometimes 3. Wet woods, New England, N. York, Michigan and Wisconsin Territory.

3. *Androgynous; stamens at the base of the spikelets.*

d. Perigynia radiating.

25. C. STELLULATA. *Good.*

Spikelets 4—6, ovate, remotish, sessile; *perig.* broad ovate, contracted into a short beak, compressed, slightly bifid, scabrous on the edge, diverging and reflexed, a little longer than the ovate, obtusish glume; *stem* erect, stiff, leafy below, 8—24 inches high. Common in wet places over the Northern States.

26. C. SCIRPOIDES. *Schk.*

Spikelets about 4, ovate, approximate, sessile, obtuse, lowest bracteate; *perig.* ovate, cordate, compressed, lanceolate or rostrate, scabrous on the margin, diverging or horizontal, longer than the ovate-lanceolate, acute glume; *stem* 6—16 inches high, leafy towards the base. Wet places in the country. The more lanceolate fruit and glume, and more flexible stem, separate it from the preceding. *C. scirpoides* has the stamens chiefly below the upper spikelet.

27. C. CURTA. *Good.*

Spikelets 4—7, ovate-oblong, upper subapproximate, lower often remote; *perig.* round-ovate, acutish, obtusish, diverging, convexo-concave, 2-toothed, slightly scabrous, longer than the ovate, white, hyaline glume; *stem* 1—2 feet high, usually light green, with silvery or hoary spikelets. Moist places over the country.

28. C. SPHÆROSTACHYA. *Dew.* C. canescens, β sphærostachya. *Tuck.*

Spikelets 3—4, ovate, roundish, remote, sessile, few fruited, 2—6; *perig.* ovate-lanceolate or roundish rostrate, longer than the ovate and hyaline white glume; *stem* 1—2 feet high, slender, flaccid, subrostrate, and with the leaves, green. Common in N. England, and N. York, in wet places.

e. Ovate-lanceolate spikelets; few-fruited.

29. C. DEWEYANA. *Schk.*

Spikelets about 3, sessile, ovate-lanceolate, alternate, subremote, highest bracteate; *perig.* oblong-lanceolate, rostrate, acuminate, bifurcate, plano-convex, slightly scabrous, on the margin, a little longer than the ovate-lanceolate, awned hyaline glume; *stem* 1—4 feet long, subprocumbent, with radical leaves; whole plant yellowish green. Common in open woods or on the borders of woods.

30. C. TRISPERMA. *Dew.*

Spikelets about 3, remote, sessile, alternate, highest ebracteate; *perig.* ovate-oblong, acute or short-rostrate, plano-convex, at the orifice entire, nerved, subscabrous on the edges, somewhat diverging, longer than the oblong acute and hyaline glume; *stem* 10—24 inches high, prostrate or recurved, filiform, slender, longer than the leaves. In tufts in marshes or wet woods; common in N. England and N. York.

f. Spikelets oval.

31. C. SCOPA'RIA. *Schk.*

Spikelets 5—10, usually 5—7, ovate, sessile, approximate, the lowest with a long deciduous bract; *perig.* ovate, lanceolate, nerved, erect, slightly margined, glabrous, longer than the lanceolate, acuminate glume; *stem* 18—24 inches high, leafy towards the root. Moist places, very common.

β. *aggregata* (*Dew.*); *spikelets* aggregated into a head, somewhat spiral.

32. C. LAGOPODIOI'DES. *Schk.*

Spikelets 8—20, cylindric, ovate, rather near, alternate and sessile; *perig.* lanceolate, tapering at both ends, concavo-convex, nerved, bidentate, scabrous on the margin, nearly twice as long as the ovate-lanceolate glume; *stem* nearly 2 feet high, leafy; the whole light green. Common.

33. C. STRAMI'NEA. *Wahl.*

Spike compound, erect; *spikelets* about 6, ovate, short-oblong, alternate, sessile, subapproximate; *perig.* broad, roundish-ovate, compressed, ciliate-serrate on the margin, beaked, 2-toothed, widely winged, commonly shorter than the ovate-lanceolate glume; *stem* 12—20 inches high, longer than the leaves; *spikelets* whitish or tawny. Common in woods and fields.

α. *brevior* (*Dew.*); *spikelets* 3—5, often closely approximate, and more nearly round; *perig.* shorter-ovate, and shorter-rostrate, scarcely longer than the ovate-lanceolate glume. This is the plant originally described by Willdenow.

β. *minor* (*Dew.*); *spikelets* small, 5—6, globose or obovate, less approximate; *perig.* small, ovate, acuminate, less winged, serrulate, about equaling the ovate acute glume.

34. C. TE'NERA. *Dew.* C. adjusta. *Boott.*

Spike compound, recurved; *spikelets* about 5, obovate, remotish, alternate, sessile, brownish, attenuated below, the lowest bracteate; *fruit* ovate, compressed, somewhat winged, rostrate, nerved, ciliate-serrate, longer than the oblong-lanceolate scale; *stem* 15—30 inches high, small and slender, erect, with a nodding spike, longer than the leaves. Light green. Common.

35. C. FESTUCA'CEA. *Schk.*

Spikelets 5—8, obovate and clubform, sessile and alternate, approximate, lower one bracteate; *perig.* roundish-ovate, rostrate, winged, striate, 2-toothed, scabrous on the margin, longer than the ovate, lanceolate glume; *stem* 15—30 inches high, erect and stiff, leafy below. Plant pale green. Spikelets greenish to brown. Common in fields, but not abundant. The *clubform* spikelets from the decurrent scales of the staminate flowers, especially mark this species.

36. C. MIRABILIS. *Dew.*

Spikelets 7—11, ovate-globose, alternate, sessile, often closely aggregated, and stiff-form, bracteate below; *perig.* ovate, sublanceolate, scabrous on the margin, concavo-convex, rostrate, 2-toothed, subdiverging, scarcely twice longer than the ovate, lanceolate glume; *stem* 18—36 inches high, erect, stiff, rough above, rather slender; plant light green. Common about fences and hedges, and has a specially rigid appearance.

37. C CRISTATA. *Schw.*

Spikelets 6—14, globose, sessile, closely aggregated into a head, of a crested form, bracteate; *perig.* ovate, oblong, compressed, winged, rostrate-acuminate, bifid, concavo-convex, scabrous on the margin, longer than the oblong, lanceolate glume; *stem* 1—3 feet high, acutely triangular. Plant yellowish green. Common in fields and meadows on colder soils.

38. C. TENUIFLO'RA. *Wahl.*

Spikelets 2—3, ovate, clustered, sessile, alternate, lower one bracteate; *perig.* ovate-oblong, acutish, plano-convex, equaling the oblong-ovate, hyaline or white glume; *stem* a foot or more high, slender, subprostrate, longer than the flat and narrow leaves. Light green. Spikelets whitish. Burlington and Salem, Vt., in swamps, *Robbins;* Oriskany and Ogdensburg, N. Y. *Kneirskern;* Southampton, Mass. *Chapman.*

C. STAMENS AND STIGMAS ON SEPARATE SPIKES.

1. *Staminate spike single.*

39. C. AU'REA. *Nutt.* C. pyriformis. *Schw.*

Staminate spike short, cylindric, pedunculate; *pistillate spikes* 3, oblong, loose-flowered, subpendulous, exsertly pedunculate, subapproximate, bracteate; *perig.* globose, obovate, or pear-form, obtuse, nerved, entire at the mouth, longer than the ovate, acute or short-mucronate glume; *stem* 3—10 inches high, slender, often subprocumbent. Plant glabrous, green. Common in wet grounds.

40. C. SAXA'TILIS. *L.*

Staminate spike oblong, thick; *pistillate spikes* 2 or 3, oblong, obtuse, sessile, lower pedunculate; *perig.* elliptic, plano-convex, obtuse, short-rostrate, about equaling the oblong and obtuse glume; *stem* 6—10 inches high, erect, with long and leafy sheaths and bracts. Spikes nearly black. White Mts., N. H. *Barratt;* Woods, Vt. *Pursh.*

41. C. CO'NCOLOR. *R. Br.*

Staminate spike erect, cylindric; *fertile spikes* 2—3, erect, subsessile, cylindric; *perig.* oval, entire, smooth, mucronate, about equal to the oblong and obtuse glume; *stem* 10—15 inches high, smooth, leafy below; *bracts* auriculate; staminate spike sometimes pistillate above. White Mts., N. H. *Boott.* Closely related to *C. cæspitosa L.* but has a smooth stem; scales of light color.

2. *Staminate spikes one or more, and the upper part of the pistillate sometimes staminate.*

42. C. RI'GIDA. *Good.*

Staminate spike oblong, cylindric, rarely 2; *pistillate spikes* 2—3, oblong, cylindric, densely flowered, short and thick, approximate, lower one subpedicellate, with a bract surpassing the stem; *perig.* ovate, obtusish, entire at the orifice; *glume* nearly twice longer than the mature fruit and subequal before; *stem* 3—8 inches high, thick and stiff, often recurved; *leaves* stiff and glaucous. Ipswich, Ms. *Oakes.* Has been compounded with *C. cæspitosa* till this time.

43. C. CÆSPITO'SA. *L.*

Staminate spike single, oblong, cylindric, sometimes 2, with oblong black scales; *pistillate spike* 2—3, cylindric, obtuse, rather thick, remotish, bracteate, lowest one short pedunculate; *perig.* ovate, obtuse, glabrous, entire at the orifice, scarcely rostrate, a little longer than the oblong, obtuse, black glume; *stem* 6—14 inches high, scabrous on the edge, leafy towards the base; *leaves* flat. Wet places, Ipswich, Mass. *Oakes;* N. York and Michigan.

44. C. STRIC'TIOR. *Dew.* C. stricta. *Goodn.*

Staminate spikes 1—2, with oblong and blackish acutish glumes; *pistillate spikes* 2—3, cylindric, staminate above, and hence acutish, lowest short-pedunculate; *perig.* ovate, compressed, acute, glabrous, entire at the orifice, early falling off, glabrous, a little longer than the oblong and acute glume; *stem* a foot and more high, triquetrous and rough on the angles, with reticulated filaments connecting the leaves towards the base; *leaves* erect, close; whole plant glaucous except the spikes. Wet places; common.

45. C. STRICTA. *Lam.* C. acuta, of American authors in part.

Staminate spikes 1—2, cylindric, lower one sessile, and the scale rusty brown and obtuse, *pistillate spikes* 2—3, long cylindric, upper half staminate, lower longer, short-pedunculate, loosely flowered below; *perig.* ovate-acuminate or elliptic, compressed, at the orifice entire or slightly emarginate and its glume strongly ferruginous, the lower ones acute-lanceolate, the upper linear and obtuse, commonly longer and narrower than the perigynia; *stem* 2 feet high, with reticulated filaments connecting the leaves. *Boott.* Wet places, as bogs; common.

46. C. ACUTA. *L.* C. cæspitosa of Am authors in part.

Spikes long and slender; *staminate* 2—3; *pistillate* 3—4, long, slender, cylindric, short pedunculate, nodding towards maturity, remotish, bracteate; *perig.* oval or oblong, obtuse, orifice protended, or very short-rostrate, about equaling the oblong, acute glume; *stem* acute, triquetrous, lax; the stamens at the summit of the pistillate spikes render them acute. Common.

β. erecta (*Dew. Schk.* fig. 85, *c*); *spikes* shorter, 2 of each; *pistillate* nearly erect, oblong, close-flowered; *perig.* shorter than the ovate-lanceolate glume. Evidently misplaced by *Schkuhr.*

γ. sparsiflora (*Dew. Schk.* fig. 92, *b.*); *pistillate spikes* very long, recurved, very sparsely flowered below Common.

47. C. AQUA'TILIS. *Wahl.*

Staminate spikes 1—4. erect, cylindric, lowest bracteate, the glume oblong, obtusish; *pistillate spikes* often 3, cylindric, thick and thickened above, 1—2 inches long, suberect, short-pedunculate, densely flowered; *perig.* elliptic, lenticular, rather small, entire, glabrous, protruded at the orifice, about equal to the ovate, acutish glume; *stem* 20—30 inches high, rather obtuse-angled and scarcely scabrous. In marshes and wet places. Common.

48. C. CRINI'TA. *Lam.* C. leonura. *Wahl. Schk.* fig. 164.

Staminate spikes one or more, lax, oblong, sometimes with a few pistillate flowers; *pistillate spikes* about 3, oblong, cylindric, pedicellate, nodding, attenuated below, and more loosely flowered, often staminate at summit; *perig.* ovate, sub-inflated, short-rostrate, entire at the orifice, glabrous, about ⅓ as long as the oblong, obtusish, scabrous-awned glume; *stem* 12—24 inches high, rough, triquetrous. Common in wet places.

β. gynandra (*Dew.* C. gynandra *Schw.*); *pistillate spikes* pendulous, thicker in the midst; *glumes* about twice as long as the perigynia.

49. C. PALEACEA. *Schreb. Schk.* fig. 125.

Pistillate spikes about 4, long-cylindric, densely flowered, recurved, with a long reclined peduncle; *perig.* ovate, suborbicular, obtusish, emarginate at the orifice, convex both sides; *glumes* terminated by a long, serrate point more than thrice the length of the perigynia; *stem* 20—42 inches high, recurved, rough-edged, pale-green. Common in dry grounds.

II. STIGMAS THREE.

D. SPIKES ANDROGYNOUS. MONŒCIOUS.

1. *Stamens at the summit.*

a. Spike single.

50. C. POLYTRICHOIDES. *Muh.* C. microstachya. *Mx.*

Spike oblong, terminal; *perig.* 3—8, oblong, alternate, subtriquetrous, glabrous, emarginate, twice longer than the ovate and obtuse, and rarely mucronate glume; *stem* 4—12 inches high, very slender, with setaceous and subradical leaves. Common in wet and cold grounds.

51. C. LENEOGLOCHIN. *Ehrht.* C. pauciflora. *Lightfoot.*

Spike about 4-flowered, with 1 or 2 staminate flowers at the apex; *perig.* lanceolate, subtriquetrous and tapering, much reflexed, twice longer than the oblong-lanceolate glume; *stem* 3—8 inches high, with subradical and linear leaves. In Ashfield and Hawley, Mass., in a marsh. *Porter.*

b. One or more radical peduncles with a single spike.

52. C. PEDUNCULATA. *Muh.*

Spikes about 5, 3-sided, distant, long, recurved, pedunculate; *perig.* obovate, triquetrous, recurved at the apex, commonly glabrous, a little longer than the oblong or obovate, mucronate glume; *stem* 4—12 inches high, triangular, rather procumbent; *stamens* sometimes removed a little from the pistillate spike. Common in woods; flowers early in the spring.

2. *Spikes staminate at the base.*

c. Spikes one, often more.

53. C. SQUAMOSA. *L.*

Spikes 1—4, oblong, cylindric, obtuse, upper one attenuated below at first by the decurrent staminate flowers, all very densely flowered; *perig.* ovate, subglobose, long-rostrate, 2-toothed, horizontal, glabrous and subsquarrose, longer than the lanceolate glume; *stem* 1—2 feet high, slender for the large spike or spikes; *lower spikes* pedunculate. Large and fine. It is *C. typhirca Mx.* when only *one spike* is present.

β. C. typhinoides (*Schw.*); *spikes* 2, the lower on a very long peduncle, and both longer and smaller.

E. SPIKES DIŒCIOUS.

54. C. SCIRPOI'DEA. *Mx.*

Spike oblong, cylindric, acutish; *staminate glume* oblong, obtusish; *perig.* ovate (oval), subrostrate, pubescent, longer than the ovate, acutish glume, scarious on the edge; *stem* 4—10 inches high, erect; *leaves* flat and long. White Mts., N. H. *Oakes.*

F. TERMINAL SPIKE ANDROGYNOUS, PISTILLATE AT THE SUMMIT; THE OTHER PISTILLATE.

55. C. VIRESCENS. *Muh.*

Spikes 2—4, oblong, erect, alternate, *the lower* sub-sessile, bracteate; *upper spike* very rarely wholly staminate; *perig.* ovate, obtuse, costate, pubescent, longer than the ovate, pubescent and mucronate glume, or about equal to it; *stem* 1—2 feet high, rather slender; *leaves* towards the base. Whole plant pubescent and light green.

β. costata (*Schw.*); *perig.* strongly costate, *outer sheaths* purplish brown; *leaves* numerous and larger. Both are common in open woods and hedges.

56. C. HIRSUTA. *Willd.*

Spikes 3, short-oblong, thick, alternate, erect, *the lower* subsessile and long bracteate, all approximate and densely flowered; *perig.* ovate, triquetrous, nerved, obtuse, entire at the orifice, glabrous in maturity, about equal to the ovate, acuminate, glabrous glume; *stem* 12—20 inches high; *leaves* and *sheaths* retrorsely pubescent; *upper spike* very rarely all staminate. Moist upland meadows. Common.

β. pedunculata. Torr.; spikes oblong-cylindric, pedunculate; *leaves* slightly pubescent. Common. C. TRICEPS (*Mx.*) much resembles this,—is not pubescent but glabrous.

57. BUXBAUM'II. *Wahl.*

Spikes about 4, cylindric, thick, upper one sometimes wholly staminate and sometimes staminate above and below; *pisti'liferous* oblong, subremote, subsessile, bracteate; *perig.* ovate-oblong, acutish, or obovate, obtuse, subtriquetrous, entire at the orifice, nerved and glabrous, scarcely equal to the oblong and mucronate glume; *stem* 10—18 inches high, leafy towards the base. Common in wet grounds. It is described as sometimes having 2 stigmas in Europe, but placed by Schk., Wahl., &c., in the division having 3.

58. C. GRACI'LLIMA. *Schw.*

Spikes 3—4, long, graceful, sub-loose-flowered, distant, long-pedicillate, recurved in maturity, bracteate, *upper one* rarely all staminate; *perig.* oblong, triquetrous, obtuse, oblique at the orifice, slightly 2-lobed, longer than the oblong and obtuse and short-awned glume; *stem* often 2 feet high, reddish towards the base, leafy and subprocumbent, pale green. Common in damp meadows.

59. C. FORMOSA. *Dew.*

Spikes 3—4, oblong, short and thick, distant, 1-sided, on a long and slender peduncle, recurved: *perig.* oblong, triquetrous, subinflated, acutish at either end, nearly entire or 2-lobed at the orifice, twice longer than the ovate and acute glume; *stem* 1—2 feet high, 3-sided, dark brown towards the base, yellowish bright green. Common in wet meadows.

60. C. DAVI'SII. *Torr.* C. Torreyana. *Dew.*

Spikes 4, oblong, cylindric, subsparsely flowered, remote, pedicillate, pendulous in maturity, *perig.* oblong-conic, subinflated, subtriquetrous, nerved, acutish, short-rostrate, 2-lobed at the orifice, glabrous towards maturity, about equaling the oblong, scabrous-awned glume; *stem* 1—2 feet high, triquetrous, scabrous above, with leaves equaling it; *leaves* and *sheaths* pubescent, sometimes but very little, light green. First found on the alluvial meadows of the Housatonic in Mass., *Dewey.* Sometimes nearly pubescent.

G. STAMINATE SPIKE SINGLE.

1. *Pistillate spikes short and sessile or nearly sessile. Perigynia radiating or diverging.*

61. C. VARIA. *Muh.*

Staminate spike erect, short or subelongated; *pistillate spikes* 3, ovate, sessile, rather near, bracteate, few-flowered; *perig.* ovate or sub-globose, subtriquetrous, acuminate-rostrate, bifid, scabro-pubescent, about equal to the ovate, acuminate glume; *stem* 6—15 inches high, erect, slender, purple towards the base; pale green. Dry woods and hedges; common.

β. pedicellata (*Dew*) has pistillate spikes ovate-oblong, short pedicillate, erect, loose-flowered; *perig.* more numerous. Grows in the same situations.

62. C. PENNSYLVANICA. *Lam.* C. marginata *Muh.*

Staminate spike erect, pedunculate, subtriquetrous, with an obtuse glume; *pistillate spikes* 1—3, ovate, subsessile, subapproximate, few-flowered; *perig.* ovate-globose, tomentose, short-rostrate, slightly 2-toothed, about equal to the ovate-acuminate, or oblong-acuminate, deep-reddish glume; *stem* 4—12 inches high, erect, stiff, with short leaves. Open woods and hedges—com-

mon—much resembles the preceding, but larger in all its parts, and readily distinguished by its different aspect and its deep reddish brown scales.

63. C. Emmonsii. *Dew.*

Staminate spike sessile, short; *pistillate spikes* 2—3, approximate, sessile, few-flowered; often one long radical peduncle; *perig.* globose-triquetrous, attenuated at the base, rostrate, pubescent, at the orifice oblique, about equal to the ovate glume; *stem* decumbent 6—10 inches high, leafy at the base, pale ash-green. On dry fields and hills; common.

64. C. Novæ-angliæ. *Schw.*

Staminate spike short, slender, oblong; *pistillate spikes* 2—3, ovate, alternate, sessile, remotish. few-flowered, bracteate; *perig.* 3—6, oval-triquetrous, rostrate, costate, slightly pubescent, a little longer than the ovate, mucronate glume; *stem* 4—8 inches high, slender, subdecumbent, longer than the leaves. Pale green. Open woods in high grounds.

β. collecta (*D.* C. collecta. *Dew.*); *stem* 10—16 inches high, very slender, erect; *pistillate spikes* 2—4, lower short pedunculate; *perig.* more tapering into a beak, slightly bidentate. High lands of Mass.; not abundant.

65. C. umbellata. *Schk.*

Staminate spike short, erect; *pistillate spikes* several, each on its radical peduncle, ovate, subumbellate; *perig.* ovate or globose, 5—8, acutish at either end, rostrate, short-bidentate, pubescent, equaling the ovate lanceolate glume; *stem* ½—4 inches high, with very long leaves.

β. vicina (*Dewey*); 1 *or* 2 *pistillate spikes* close to the staminate, sessile; *the other pistillate spikes* on their own stems or radical peduncles. In small tufts on dry hills. Both varieties grow on the same root, but Schk. saw and figured only the first.

66. C. præcox. *Jacq.*

Staminate spike erect, subclavate; *pistillate spikes* 1—3, ovate, bracteate, approximate; lower one short-pedunculate; *perig.* 6—12, ovate and subglobose, triquetrous, pubescent. short-rostrate, equal to the ovate, acute, or mucronate glume; *stem* 2—6 inches high, leafy at the base. On rocky hills, Salem, Mass. *Pickering*; Ipswich, Mass. *Oakes.*

2. Pistillate Spikes with nearly inclosed peduncles.

67. C. vesti'ta. *Willd.*

Staminate spike single, rarely 2, cylindric, oblong; *pistillate spikes* 2, ovate-oblong, sessile, subapproximate, bracteate, often with stamens above; *perig.* ovate, oblong. subtriquetrous, nerved, short-rostrate, bifid, pubescent, a little longer than the ovate-oblong, acutish, submucronate glume; *stem* 18—30 inches high, acutely triangular and leafy below. Common in wet places over the country.

68. C. pube'scens. *Muh.*

Pistillate spikes 2—3, oblong, rather loose-flowered, erect, bracteate, the lowest pedunculate; *perig.* ovate-triquetrous, rostrate, nearly entire at mouth, pubescent, a little longer than the ovate-oblong, carinate, mucronate glume; *stem* 10—20 inches high, and with the leaves, pubescent. Moist woods and meadows; common.

69. C. flava. *L.*

Pistillate spikes 2—4, ovate-oblong, approximate, sometimes androgynous; *perig.* ovate, closely imbricate, costate, bidentate, reflexed with a long curved beak, longer than the ovate-lanceolate glume; *stem* 10—20 inches high, rather obtusely angled or triquetrous, glabrous; yellowish green. Wet and cold soils; common.

70. C. Æ'deri. *Ehrhart.*

Spikes sometimes androgynous; *pistillate* about 4, clustered, nearly sessile, short-oblong, sometimes staminate above or below, bracteate; *perig.* rather

obovate, subinflated, nerved, bidentate, diverging with a subulate beak, a little longer than the ovate glume; *stem* 2—10 inches high, leafy. Pale yellow. Mass. and N. Y.—abundant in Pittsfield, Mass. and at Niagara Falls.

71. C. TENTACULA'TA. *Muh.*

Pistillate spikes 2—4, oblong, cylindric, bracteate, upper one sessile, the rest nearly sessile, densely flowered; *perig.* ovate, inflated, long rostrate, bidentate, nerved, diverging, glabrous, twice longer than the ovate and small scabro-mucronate glume; *stem* 1—2 feet high, often large, triquetrous; *leaves* linear-lanceolate, longer than the stem. In clusters in wet or marshy places; common.

72. C. ROSTRA'TA. *Mx.*

Staminate spike short and small; *pistillate spikes* 2—3, subglobose, or capitate, bracteate; *perig.* aggregated into a head, small, erect, or subdiverging, oblong-conic, very long-rostrate, slightly inflated at the base, twice longer than the ovate-oblong, acutish glume; *stem* 8—16 inches high, few-leaved, erect, stiff. Pale yellow. At the base of the White Mts., N. H.—*Oakes;* also in Canada, where Mx. found it. Has been called a variety of *C. Xanthophysa. Wahl.*

73. C. INTUME'SCENS. *Rudge.* C. folliculata. *Schk.* fig. 52.

Staminate spike oblong, pedunculate; *pistillate spikes* 1—3, few-flowered, approximate, bracteate, erect, nearly sessile, the lower one sometimes remote and exsertly pedunculate; *perig.* ovate-conic, large and much inflated, acuminate-rostrate, bidentate, nerved, diverging, very glabrous, thrice longer than the ovate-cuspidate glume; *stem* a foot or more high, erect, stiff, leafy, dark green and very glabrous. Wet grounds, in open woods, or marshes. Common.

β. globularis (*Gray*); *Pistillate spikes* large, globular, many fruited; grows in the same situations.

74. C. FOLLICULA'TA. *L.* C. Xanthophysa. *Wahl.*

Pistillate spikes 2—4, ovate or capitate, densely flowered, distant, the peduncles sometimes projecting far beyond the sheaths, often staminate at the apex, long bracteate; *perig.* oblong-conic, much inflated, diverging or horizontal, long-rostrate, twice longer than the oblong-ovate, acute glume; *stem* 2—5 feet high, leafy; *leaves* linear-lanceolate, long and flat. Pale yellow. In wet or marshy places; common.

75. C. LUPULI'NA. *Muh.* C. lurida. *Wahl.*

Staminate spike erect, slender, subsessile; *pistillate spikes* 2—4, ovate-oblong, large and thick, or oblong-cylindric, short-pedunculate, erect, densely flowered, approximate, the lowest sometimes long-pedunculate and distant; *perig.* ovate-conic, ventricose, long, conic-rostrate, bicuspidate, nerved, glabrous, about thrice longer than the ovate-lanceolate, acuminate glume; *stem* 1—3 feet high, triquetrous leafy; *leaves* and *bracts* long, flat, wide, striate, scabrous on the edge. Bright green. Finely named from its *hop-like* spikes. Marshes and about ponds; common.

β. polystachya (*Torr.*); *pistillate spikes* about 5, very long cylindric, the lowest remote and very long pedunculate; *perig.* less inflated. Swamps in Phillipstown, N. Y., on the Highlands. *Barratt.*

2. *Pistillate spikes exsertly pedunculate.*

76. C. PLANTAGINEA. *Lam. Schk.* fig. 70. C. latifolia. *Wahl.*

Staminate spike erect, large, sub-clavate, with oblong and acute glumes; *pistillate spikes* 3—5, oblong, erect, remote, sparse-flowered, 2 upper nearly inclosed-pedunculate, the lower ones exsertly pedunculate, with subulate bracts; *perig.* oblong, triquetrous-elliptic or cuneiform, tapering at either end, recurved at the apex, and entire at the orifice, longer than the ovate-cuspidate glume; *stem* 8—18 inches high, erect, triquetrous, with dark-brown sheaths; *leaves* radical, broad, ensiform, strongly 3-nerved. Bright green. Hedges and open woods; common, and one of the first appearing species in the spring.

77. C. CAREYANA. *Dew.*

Staminate spike erect, oblong, with oblong and obtuse glumes; *pistillate spikes* 2—3, ovate, loose and few-flowered, distant, upper subsessile, all bracteate; *perig.* ovate, triquetrous, subinflated, nerved, acuminate, tapering at the base, smooth and glabrous, entire at the orifice, twice longer than the ovate mucronate glume; *stem* 1—2 feet high, erect, smooth, leafy towards the base; *leaves* linear-lanceolate. Pale green. Woods. Auburn, N. Y.—*Carey;* and in various places in Ohio; closely related to *C. plantaginea*, and to *C. Fraseri* of the Southern States.

78. C. ANCEPS. *Schk.* C. plantaginea. *Muh.*

Pistillate spikes 2—4, subfiliform, erect, attenuate, sparse-flowered, remote, with a 2-edged peduncle, leafy-bracteate, upper one subsessile; *perig.* ovai-triquetrous, tapering at both ends, short-rostrate, attenuate, glabrous, striate, excurved at the apex, a little longer than the oblong-mucronate or ovate-acute glume; *stem* 6—12 inches high, acutely triquetrous; *leaves* radical, of medium width. Glaucous or light green. Woods and hedges. Common.

β. *patulifolia* (*Dew.* C. anceps. *Schk.* fig. 195); *leaves* radical, broad, *many nerved*, narrower at the base; *sheaths* with long and leafy bracts; *perig.* longer rostrate.

γ. *angustifolia* (*Dew. Schk.* fig. 128); *stem* a foot high; *leaves* narrow, striate, long; *perig.* short-rostrate and much recurved.

79. C. BLANDA. *Dew.* C. conoidea. *Muh.*

Pistillate spikes 2—4, oblong, cylindric, subsparse-flowered, alternate, approximate, bracteate, highest subsessile, the lowest on a long, 2-edged peduncle; *perig.* obovate, subtriquetrous, nerved, recurved at the apex, entire at the orifice, little longer than the ovate, scabro-mucronate glume; *stem* 6—12 inches high, triquetrous, leafy towards the base; *leaves* long as the stem. Pale green, or glaucous. Meadows and dry open woods. Common.

80. C. CONOIDEA. *Schk.* C. granularioides. *Schw.*

Pistillate spikes 2—3, oblong, or ovate-oblong, remote, erect, rather dense-flowered, bracteate; *perig.* oblong-conic, obtusish, glabrous, nerved, subdiverging, entire at the mouth, a little longer than the ovate-subulate glume; *stem* 8—12 inches high; *leaves* towards the base, shorter than the stem. Bright green. Moist upland meadows. Common.

81. C. TETANICA. *Schk.* fig. 207.

Pistillate spikes 2—3, oblong, loose flowered, remote; *perig.* obovate, recurved at the apex, entire at the orifice, with an ovate glume, obtusish at the upper and mucronate at the lower part of the spike; *stem* 6—10 inches high, triquetrous, longer than the flat and linear-lanceolate leaves. Light green. Upland meadows. Rare.

82. C. DIGITALIS. *Willd.*

Pistillate spikes about 3, 4—10-flowered, oblong, distant, loose-flowered, lax and recurved; *perig.* ovate, triquetrous, alternate, nerved, glabrous, short and obtuse, entire at the orifice, longer than the ovate-lanceolate glume; *stem* 4—12 inches high, triquetrous, shorter than the long, decumbent leaves. Pale green.

β. *Van Weckii* (*Dew.*); Smaller; *perig.* more remote and smaller. Open moist woods; common. Has been mistaken for *C. oligocarpa. Schk. & Muh.*

83. C. RETROCURVA. *Dew.*

Pistillate spikes 2—4, on long, filiform and recurved peduncles, bracteate, sub-dense-flowered, short and thick oblong; *perig.* ovate, triquetrous, nerved, obtusish, equaling the ovate cuspidate glume; *stem* 6—12 inches high, prostrate; *leaves* radical and wide; glaucous. Open woods; rare. Has been considered, *C. digitalis, Willd.;* but is different.

84. C. OLIGOCARPA. *Schk.*

Pistillate spikes 2—3, erect, 3—4-flowered, bracteate; *perig.* obovate, roundish-triquetrous, short-rostrate, entire at the mouth, longer than the

oblong-mucronate glume; *stem* 6—12 inches high; *leaves* flat and shorter towards the base; *plant* light green. Open woods or hedges—rare; differs from the following species in its fruit and pubescence.

85. C. HITCHCOCKIANA. *Dew.*

Staminate spike erect, pedunculate; *pistillate spikes* 2—3, erect, few-flowered, lowest distant; *perig.* oval triquetrous, tapering at both ends, inflated, alternate, bent at the apex, striate, with a short, truncated and open beak, about equaling or shorter than the oblong or ovate, mucronate glume; *stem* 10—24 inches high, erect, stiff, scabrous above, with long and leafy bracts; *stem leaves and bracts* scabrous and subpubescent. Borders of woods. Cannot be the *C. oligocarpa* figured by Schkuhr.

86. C. LAXIFLORA. *Lam.*

Staminate spike oblong, slender; *pistillate spike* 2—4, oblong, lax-flowered, few-flowered, erect, remote; *perig.* ovate or oblong-ovate, obtusish, glabrous, ventricose, nerved, subtriquetrous, entire at the mouth, a little longer than the ovate scabro-mucronate glume; *stem* 10—18 inches high, triquetrous, leafy. Bright, to pale green. Woods, hedges and meadows. Common.

87. C. GRANULARIS. *Muh.*

Pistillate spikes 2—4, cylindric, oblong, dense-flowered, suberect; *perig.* roundish-ovate, nerved, very short-beaked and recurved, entire at the orifice, nearly twice as long as the ovate-acuminate glume; *stem* 8—16 inches high, erect or subdecumbent, smooth, leafy. Glaucous green except the mature yellow spikes. Moist soils in meadows and hedges, along brooks. Abundant.

88. C. PANICEA. *L.*

Pistillate spikes 2—3, loose-flowered, remotish, lowest long pedunculate; *perig.* subglobose, obtuse, entire at the mouth, a little greater than the ovate, subacute glume; *stem* a foot high, triquetrous, leafy at the base; *leaves* shorter than the stem. Light green. Near Boston. *Pickering.*

89. C. BINERVIS. *Smith.*

Pistillate spikes 3, oblong, cylindric, subdense-flowered; *perig.* ovate, round, short-rostrate, bicuspidate, smooth, binerved, twice longer than the ovate, subacute glume; *stem* a foot high or more, triquetrous, leafy towards the base. Pale green. Near Boston. *B. D. Greene.*

90. C. GREENIANA. *Dew.*

Staminate spike one and erect, sometimes 2; *pistillate spikes* 2—3, oblong, bracteate, pedunculate; *perig.* ovate-lanceolate, triquetrous, nerved, rostrate, bifurcate, subdense-flowered, about equal to the ovate, cuspidate glume; *stem* 1—2 feet high, scabrous above, leafy towards the base. Light green. Resembles *C. pelva, Good.*, but differs in its fruit and glume. Near Boston. *B. D. Greene.* Rare.

91. C. GRAYANA. *Dew.*

Staminate spike oblong; *pistillate spikes* 2—3, oblong-cylindric, subloose-flowered; *perig.* ovate-oblong, subtriquetrous, subinflated, obtuse or acutish, entire at the orifice, longer than the obtuse, oblong glume; *stem* 6—16 inches high, erect, triquetrous, striate, with leaves about its own length. Glaucous green. Sphagnous swamp near Utica, N. Y. *Gray.* Cedar swamp, N. J. *Torrey;* has been supposed to be *C. livida. Wahl.*, from which it differs in several respects.

92. C. HALSEYANA. *Dew.*

Staminate spike oblong, erect, sessile, often 2, approximate; *pistillate spikes* 1—2, oblong, cylindric, erect, loose-flowered, sometimes staminate above; *perig.* ovate, short-rostrate, subtriquetrous, inflated, glabrous, oblique at the orifice, a little longer than the ovate, subacute glume; *stem* 1—2 feet high, acutely triquetrous; *leaves* linear-lanceolate, shorter towards the base. Dark green. Upland meadows. Westfield, Ms. *Davis;* plains of N. J. *Kneiskern.*

93. C. CAPILLARIS. *L.*

Staminate spike small; *pistillate spikes* 2—3, ovate, oblong, about 6-flowered, loose-flowered, long and recurved pedunculate; *perig.* oval, short-rostrate, oblong, oblique at the orifice, longer than the oblong, ovate, obtuse glume; *stem* 2—7 inches high, leafy at the base; *leaves* narrow, long. Grows in tufts. Pale green. Alpine regions of the White Mts. *Robbins.*

94. C. EBURNEA. *Boott.* C. alba, β. setifolia. *Dew.*

Pistillate spikes 2—3, erect, 3—6-flowered, ovate, with white, leafless sheaths, and the upper higher than the staminate spike; *perig.* ovate-globose, rostrate, or slightly obovate, glabrous and brown in maturity, twice longer than the white, ovate, hyaline glume; *stem* 4—10 inches high, erect, with subradical and bristle-form leaves. Pale green. Common. Abundant along the banks of the Genesee.

95. C. DE'BILIS. *Mx.* C. flexuosa. *Schk.*

Staminate spike erect, filiform; *pistillate spikes* 3—4, filiform, loose-flowered, flexuous, nodding, remotish, 1—2 inches long; *perig.* oblong-lanceolate, subtriquetrous, alternate, rostrate, bifid, glabrous nerved, nearly twice longer than the ovate-lanceolate glume: *stem* 1—2 feet high, triquetrous and scabrous above, leafy towards the base. Bright green. Moist woods and meadows. Common.

96. C. ARCTATA. *Boott.* C. sylvatica. *Dew.*

Pistillate spikes 3—4, long and slender, loose-flowered, nodding and remote; *perig.* ovate, triquetrous, lanceolate or long-rostrate, subventricose, bifid, glabrous, little surpassing the ovate, membranaceous, mucronate glume; *stem* 10—20 inches high, scabrous above, and leafy below. Pale green. In the same situations as the preceding. Common.

97. C. FLE'XILIS. *Rudge.* C. castanea. *Wahl.* C. blephoriphora. *Gray.*

Pistillate spikes 2—4, ovate-oblong, cylindric, nodding; *perig.* ovate, subconic, rostrate, bidentate, scarcely shorter than the ovate, obtusish, oblong glume; *stem* 12—18 inches high, erect, striate; *leaves* short, and shorter below; *leaves* and *bracts* ciliate. Bright green. Oneida Co., N. Y. *Gray.*

98. C. WASHINGTONIANA. *Dew.*

Staminate spike erect, with oblong and obtuse black glumes; *pistillate spikes* 2—5, oblong, cylindric, subremote, erect, loose-flowered, black or dark brown, subdistant, upper sessile; *perig.* oval, acutish at both ends, glabrous, short-rostrate, entire at the orifice, about equaling the ovate-oblong, subacute blackish glume with a white edge; *stem* a foot or more high, triquetrous, subscabrous above. Light green. Seed distinctly triquetrous. Near summit of Mt. Washington, N. H. *Barrett.* Is distinct from *C. saxatilis, L.* already described as found on the White Mts.

4. Pistillate spikes scarcely sheathed.

99. C. PALLESCENS. *L.*

Pistillate spikes 2—3, oblong, short, cylindric, distant, nodding towards maturity; *perig.* oval, obtuse, round, about equal to, or a little shorter than, the ovate glume; *stem* 6—16 inches high, hardly erect; *bracts* sometimes transversely rugose. Plant often subpubescent, and of a light green. In dry meadows. Common.

100. C. UNDULATA. *Kunze.*

Pistillate spikes 2, erect, ovate-oblong; *perig.* oblong, round, triquetrous, obtuse, striate, very short-beaked, bidentate, longer than the oblong, cuspidate, mucronate glume; *stem* 12—18 inches high, erect, triquetrous, scabrous; *lower bract* transversely waved-plicate; *leaves* pubescent. In the same situation as the preceding, and scarcely to be distinguished from it.

101. C. TORRE'YI. *Tuckerman.*

Staminate spike oblong, short pedunculate; *pistillate spikes* 2—3, short, oblong, subsessile, erect; *perig.* oblong, obovate, very obtuse, glabrous,

subtriquetrous, entire at the orifice, subrostrate, twice longer than the acute glume; *stem* 12—18 inches high, erect, triquetrous, with subradical and pubescent leaves. Pale green. N. Y. *Tuckerman.*

102. C. MILIA'CEA. *Muh.*

Staminate spike erect, slender; *pistillate* 2—3, long-cylindric, slender, loose-flowered below, nodding; *perig.* ovate, triquetrous, glabrous, subrostrate, entire at the orifice, longer than the oblong, emarginate or obcordate awned glume; *stem* 12—24 inches high, slender, scabrous; *leaves* linear-lanceolate. Yellowish green. Wet meadows; common.

103. C. LIMOSA. *L.*

Pistillate spikes 1—3, ovate or oblong, long-pedunculate, subloose-flowered, smoothish, pendulous; *perig.* elliptic, compressed, very short-rostrate, entire at the orifice, about equal to the oblong and obtuse, or ovate cuspidate glume; *stem* 8—16 inches high, ascending, obtusely triquetrous, with subradical, flat and narrow leaves. Glaucous green. Marshes, common.

104. C. RARIFLORA. *Smith.* C. limosa. *β.* rariflora. *Wahl.*

Pistillate spikes about 2, linear, quite loose-flowered, long-pedunculate, nodding; *perig.* ovate-oblong, triquetrous, depressed, equaling the ovate, subcircinate, brown glume; *stem* 10 inches high. Glaucous. White Mountains, N. H. *Barratt.*

105. C. IRRIGUA. *Smith.* C. limosa. *β.* irrigua. *Wahl.*

Pistillate spikes 2—3, ovate-oblong, thickish, nodding; *perig.* roundish-ovate, short-rostrate, subcompressed, shorter than the ovate-lanceolate, red-brown glume; *stem* near a foot high, longer than the flat, subrecurved leaves; glaucous. Staminate spike rarely pistillate at the summit, or pistillate with stamens at the base. Marsh. Bridgewater, N. Y. *Gray;* also in marshes in Mass. and Mich. *Cooly.* Rare.

106. C. HYSTERICI'NA. *Willd.*

Staminate spike rarely pistillate, at the summit; *pistillate spikes* 2—4, oblong, cylindric, attenuate, subdistant, long-bracteate, nodding, rarely sheathed; *perig.* ovate, inflated, subtriquetrous, nerved, bifid, glabrous, twice longer than the oblong, emarginate, submucronate glume; *stem* 12—24 inches high, scabrous above, with long, linear-lanceolate leaves. Yellowish green. Wet places; very common.

107. C. PSEUDO-CYPE'RUS. *L.* C. furcata. *Ell.*

Staminate spike long and slender, rarely pistillate above; *pistillate spikes* 2—5, long-cylindric, pendulous, thick, dense-flowered, with very long and leafy bracts; *perig.* ovate-lanceolate, acuminate, rostrate, 2-forked, reflexed, triquetrous, glabrous, generally longer than the lanceolate, mucronate-setaceous, glume; *stem* 18—30 inches high, large, rough, with long and wide, rough leaves and bracts. Plant very glabrous and yellowish green. Wet places about ponds and ditches. Common.

188. C. COOLE'YI. *Dew.*

Staminate spike short and small, with oblong-lanceolate glumes; *pistillate spikes* 2—4, cylindric, oblong, or ovate and short, rather dense-flowered, *upper* sessile, *lower* on very long, recurved peduncles; *perig.* ovate-rostrate or oblong-lanceolate, bifurcate, nerved, about equal to the ovate, awned, scabrous glume; *stem* filiform and scabrous, subprostrate, a foot or more high, much shorter than the subradical, narrow leaves. Light green. Marsh in Macomb Co., Mich. *Cooley.*

109. C. SCABRATA. *Schw.*

Pistillate spikes 3—6, cylindric, subrecurved, remotish, long-pedunculate; *perig.* ovate-oblong, subinflated, subbifid, rostrate, quite scabrous, longer than the ovate-lanceolate, acuminate, short-bidentate, ciliate glume; *stem* 1—2 feet high, acutely triquetrous, rough above, longer than the leaves towards the base. Bright green. Along brooks and streams. Common.

H. STAMINATE SPIKES USUALLY TWO OR MORE.

110. C. SCHWENI'TZII. *Dew.*

Staminate spikes 2, rarely 1, *upper* long and slender, *lower* with a few perigynia at the base; *pistillate spikes* 2—4, oblong, cylindric, subapproximate, subrecurved, subloose-flowered, lowest often long-pedunculate; *perig.* ovate-oblong, tapering above, rostrate, inflated, nerved, glabrous, bifurcate, longer than the lanceolate, subulate, subsetaceous glume; *stem* 6—12 inches high, scabrous above, very leafy. Pale yellowish green. Wet sandy grounds. Not abundant.

111. C. RETRORSA. *Schw.*

Staminate spikes about 3, rarely 1, often with a few perigynia at the base; *pistillate spikes* 4—6, oblong cylindric, approximate, dense-flowered, with long and leafy bracts, the lowest often remote and long-pedunculate; *perig.* ovate-inflated, subglobose, rostrate, bifurcate, nerved, reflexed, twice longer than the lanceolate glume; *stem* 15—30 inches high, scabrous above, large, stiff and leafy. Bright green. In clusters about pools of water, common. The lower spikes sometimes have 1 or 2 smaller spikes attached to them.

112. C. ARISTATA. *R. Br.*

Pistillate spikes 2—4, cylindric, distant, close-flowered, erect; *perig.* ovate, oblong, nerved, deeply bifid, very glabrous, long-rostrate, longer than the oblong, awned glume; *leaves* and *sheaths* villose on the under side; *stem* a foot or more high. Bright green. Watertown, N. Y. *Torr. & Gray.* Is not this very closely related to the following species?

113. C. TRICHOCARPA. *Muh.*

Staminate spikes about 3, erect, rarely 1, or pistillate above, cylindric, *lower* shorter; *pistillate spikes* 2—4, erect, long-cylindric, smoothish, rather loose-flowered; *perig.* ovate, conic, inflated, nerved, rostrate, bifurcate, densely pubescent, about twice longer than ovate-lanceolate glume; *stem* 15—30 inches high, scabrous above, and with pubescent leaves and sheaths. Light green. In wet and marshy places. Common.

β. turbinata (*Dew.*); *pistillate spikes* ovate, or short-oblong, thick, remote, dense-flowered; *perig.* subdiverging, ovate and conic, rostrate, longer than the ovate-oblong, mucronate glume; *stem* 2—3 feet high. Glaucous green. In a pond in Beekman, N. Y., there abundant.

114. C. LONGIROSTRIS. *Torr.*

Staminate spikes 3, short; *pistillate spikes* 2—3, cylindric, quite loose-flowered, pendulous, subdistant, with filiform peduncles; *perig.* ovate, globose, inflated, glabrous, long-rostrate, hispid, a little longer than the lanceolate or ovate, cuspidate glume; *stem* 15—30 inches high, rather slender, stiff, leafy below. Bright green. On light soil of hedges in N. England and N. York. Common.

115. C. LANUGINOSA. *Mx.* C. pelita. *Muh.*

Staminate spikes 2, oblong, slender, erect; *pistillate spikes* 2—3, cylindric, erect, dense-flowered, sometimes short-oblong and thick, subrostrate; *perig.* ovate, short-rostrate, bicuspitate, subtriquetrous, thick, pubescent and woolly, about equaling the ovate-lanceolate awned glume; *stem* 12—24 inches high, nearly round, below, with flat, linear-lanceolate leaves and bracts. Glabrous and yellowish green. Wet places and marshes. Common.

116. C. FILIFORMIS. *Gooden.*

Staminate spikes 2—3, with oblong glumes; *pistillate spikes* 2—3, ovate, oblong, short-cylindric, close-flowered, remotish, erect; *perig.* ovate, villose, short-rostrate, bifurcate, about equaling the ovate, acute glume; *stem* 20—30 inches high, erect, slender, stiff, with convolute leaves and bracts. Pale green. Marshes. Common.

117. C. LACUSTRIS. *Willd.*

Staminate spikes 3—4, erect, sessile; *pistillate spikes* 2—3, erect, oblong, cylindric, short-pedunculate; *perig.* ovate-oblong, tapering or lanceolate,

bifurcate, glabrous, a little longer than the oblong, mucronate glume; *stem* 2—3 feet high, scabrous above, erect and large, with long and large leaves and bracts. Light green. Marshes. Common.

118. C. RIPA'RIA. *Gooden.*

Staminate spike 3—5, oblong, thick, erect, sessile; *pistillate spikes* 2—3, erect, oblong, often long-cylindric; *perig.* ovate-elliptic, contracted into a short, bifurcate beak, glabrous, about equaling or shorter than the ovate, mucronate, or oblong-lanceolate glume; *stem* 2—3 feet high, scabrous above, leafy below. Bright green.

119. C. OLIGOSPERMA. *Mx.* Oakesiana. *Dew.*

Staminate spikes several, sometimes one, erect, slender, long-cylindric, with an oblong obtusish glume; *pistillate spikes* 1—3, ovate, globular, sessile, distant; *perig.* few, ovate, inflated, acute, nerved, short-rostrate, entire at the orifice, glabrous, a little longer than the ovate lanceolate glume; *stem* 1—2 feet high, scabrous above, leafy below; *leaves* involute and rush-like. Light green. About the lakes of N. Eng. and N. Y. Abundant in marshes of Mich.

120. C. VESICARIA. *L.*

Staminate spikes about 3, erect, oblong; *pistillate spikes* 2—3, cylindric, erect, dense-flowered, alternate, long bracteate; *perig.* ovate, oblong-conic, terete, inflated, rostrate, nerved, diverging, glabrous, bicuspidate, nearly twice longer than the oblong-lanceolate glume; *stem* about 2 feet high, shorter than the leaves. Bright green. Marshes. Not common.

β. utriculata (*Dew.* C. utriculata. *Booth*); *perig.* oblong-elliptic, nerved, cylindric-rostrate, bicuspidate, more or less longer than the lanceolate, scabrous-awned glume. Marshes, with the other.

121. C. AMPULLA'CEA. *Gooden.*

Staminate spikes 2—4, oblong, cylindric, erect; *pistillate spikes* 2—3, long-cylindric, erect, close-flowered, short-pedunculate, sometimes staminate above; *perig.* subglobose, inflated, diverging, nerved, glabrous, setaceous, rostrate, bifurcate, little longer than the lanceolate glume; *stem* 2—3 feet high, obtusely triquetrous, leafy. Light green. Marshes. Common.

122. C. MONI'LE. *Tuckerman.*

Staminate spikes 2—4, long, slender, cylindric, with a long lanceolate glume; *pistillate spikes* 2, long, cylindric, short-pedunculate, subloose-flowered, erect; *perig.* ovate, long-conic, subtriquetrous, inflated, rostrate, bicuspidate, more than twice longer than the oblong-lanceolate glume; *stem* 15—30 inches high, erect, with long leaves and bracts. Bright green. Marshes; not common. More loose-flowered and fruit longer than that of *C. visicaria. L.*

123. C. BULLA'TA. *Schk.*

Staminate spikes 3, erect, slender, cylindric, with oblong-lanceolate glumes; *pistillate spikes* 2—3, rather long, cylindric, nearly erect: *perig.* ovoid-globose, inflated, glabrous, costate, with a long scabrous beak, bifurcate, longer than the lanceolate glume; *stem* 20—30 inches high, rather slender, triquetrous, scabrous above, leafy and shorter than the leaves. Glabrous, light green. In wet meadows. Common.

124. C. TUCKERMANI. *Dew.*

Staminate spikes 2—3, cylindric, lower ones sessile and short, with an oblong, acutish glume; *pistillate spikes* 2—3, oblong, cylindric, thick and large, pedunculate, subloose-flowered; *perig.* inflated, ovate, large, conic, costate, bifurcate, glabrous, nerved, twice longer than the ovate-lanceolate glume; *stem* about 2 feet high, erect, scarcely scabrous; *bracts* and *leaves* long, not wide; light green. Wet places in meadows, common, and has been ranked under *C. bullata.*

125. C. MIRATA. *Dew.* C. arista. *Dew.* not of *R. Br.*

Staminate spikes 2 or more, long cylindric; *pistillate spikes* about 2, long-cylindric, pedunculate, subdense-flowered, suberect; *perig.* ovate, conic, long

rostrate, costate, bifurcate, glabrous, subinflated at the base, about equaling the ovate, long-setaceous or long awned glume; *stem* about 2 feet high, rough; *leaves* and *bracts* larger than the stem; light green. Shores of lake Ontario, N. Y. *Sartwell.* Also found in the State of Georgia.

ORDER CLXI. GRAMINEÆ. *The Grass Tribe.*

Fls.—In little spikelets composed of bracts imbricated in 2 rows.
Glumes.—Outer bracts (*calyx, Linn.*) generally 2 and unequal, sometimes 1 only.
Paleæ.—Inner bracts (*corolla, Linn.*) 2, alternate, the lower (exterior) one simple, the upper (interior) often doubly carinate, being composed of 2 pieces united by their edges.
Scales.—Innermost bracts (*nectary, Linn.* rudimentary petals) 1—3, distinct or united, membranous, hypogynous.
Sta.—1—6, commonly 3. *Anthers* versatile.
Ova.—Simple, with 2 *styles* and 2 feathery *stigmas.* *Fruit* a caryopsis.
Seed—With the embryo situated on the outside of farinaceous albumen, at the base, next the hilum.

An immense order of herbaceous plants, of the highest importance to man. Stems (*culms*) mostly cylindrical, hollow, jointed and closed internally at the nodes. Leaves alternate, entire, parallel-veined and generally linear, sheathing at the base, with the sheaths split down to the node on one side. Flowers generally perfect, the spikelets arranged in spikes, racemes or panicles. The grasses are universally diffused throughout the world, having no other limits than those that bound vegetation in general. But the species and their characters are widely different in different climes. In temperate zones the grasses clothe a large portion of the earth's surface with a compact, soft, green, carpet-like turf; but in tropical regions this beautiful grassy turf disappears and the grasses become larger, more isolated like other plants, fewer in the number of individuals, with broader leaves and more showy flowers.

Properties. This family doubtless contributes more to the sustenance of man and beast than all others combined. Its sweet and nutritious properties reside both in the farinaceous albumen of the seed and in the herbage. No poisonous or even suspicious herb is found among them, with the single exception of Lolium temulentum. The poisonous and medicinal *ergot* or *spurred rye* is only a parasitic fungus, and therefore forms no exception to this remark. The stems of many grasses contain sugar, as the *maize* and *sugar-cane.* Silex is also a frequent ingredient. To this order belong the common *grains*, maize, wheat, rye, rice, barley, oats, &c. The most important of the cultivated *grasses* are Phleum or *Timothy grass*, several kinds of Poa, Agrostis, Alopecurus, Festuca, Aira, Panicum, Cinna, Briza, &c.

Conspectus of the Genera.

* *Spikelets* 1-*flowered.*

Spikelets solitary,	Glumes large,	acute or mucronate.	Paleæ awned		Fruit white.	*Oryzopsis.* 4
				cartilaginous, sessile.	Fruit black.	*Piptatherum.* 3
				cartilaginous, stipitate.	Fruit black.	*Stipa.* 2
			with a single awn,	herbaceous, naked.	Stamen 1.	*Cinna.* 9
				herbaceous, hairy.	Stamens 3.	*Calamagrostis.* 12
				membranaceous, 1-keeled.		*Agrostis.* 5
			lower one with 3 awns; upper very minute.			*Aristida.* 1
			Paleæ awnless,	2. Paleæ coriaceous.		*Milium.* 17
				2. Paleæ membranaceous.		*Agrostis.* 5
				2. Stigmas 2.	Stigmas 3. Panicle dense.	*Psamma.* 11
				2. Stigmas 3.	solitary. Panicle capillary.	*Trichodium.* 7
			awned as well as the paleæ. Panicle conglomerate.			*Polypogon.* 6
			Glumes minute,	subequal, one awned.	Panicle capillary.	*Trichochloa.* 10
				unequal, one of them hardly perceptible.		*Muhlenbergia.* 8
			Glumes 0.	Stamens 1, 2 or 3.	Paleæ awnless.	*Leersia.* 48
				Stamens 6.	Paleæ awned. Polygamous.	*Zizania.* 49
	in panicles.		in unilateral spikes.		Glumes unequal, lanceolate. Aquatic.	*Spartina.* 15
					Glumes equal, roundish, thin.	*Paspalum.* 16
			in cylindrical spikes.		Awns shorter than the glumes.	*Phleum.* 14
					Awns longer than the glumes.	*Alopecurus.* 13
Spikelets in pairs or 3s, polygamous.			Stems fistulous.		Glumes with long awns. Spike 1.	*Hordeum.* 43
					Glumes awnless. Sterile fl. pedicellate.	*Andropogon.* 46
			Stem solid with pith. Flowers paniculate.			*Sorghum.* 47

** *Spikelets* 2-*flowered, one of the flowers abortive.*

Inflorescence paniculate...	Glumes unequal.	*Panicum.* 18
	Paleæ awnless. Glumes equal, striped.	*Phalaris.* 21
	Paleæ awned. Glumes unequal.	*Holcus.* 22
Inflorescence linear, unilateral spikes, generally digitate.		*Digitaria.* 19
Inflorescence a compound, cylindrical, bristly spike.		*Setaria.* 20

*** *Spikelets 2—30-flowered; when but 2-flowered both perfect or both staminate.*

- Stems fistulous between the nodes.
  - Inflorescence paniculate.
    - Lower paleæ awned . . .
      - near the base;
        - apex entire. Sta. 2. *Anthoxanthum.* 24
        - apex bifid. Awn bent. *Avena.* 28
        - apex multifid. . *Aira.* 25
        - which has 2 bristly teeth. *Trisetum.* 26
      - on the back near the apex
        - which is merely bifid. *Bromus.* 31
        - with long, silky hairs. *Arundo.* 29
        - which is entire and naked. . . *Festuca.* 32
        - between the 2 teeth; awn twisted. *Danthonia.* 30
        - which is tricuspidate . . . *Uralepsis.* 27
        - which is eroded. Perfect fl. diandrous. *Hierochloa.* 23
      - at the apex
    - Lower paleæ awnless, .
      - entire. denticulate. bifid and tricuspidate
        - Spikelets ovate . . .
          - Ter. ped. flowered.
            - Ovary with 2 scales. *Poa.* 36
            - Ova. adnate to paleæ. *Festuca.* 32
            - Terminal pedicel flowerless. *Koeleria.* 33
          - Spikelets acute at base, flat, ancipital. . *Uniola.* 38
          - Spikelets cordate at base, tumid. . . *Briza.* 37
  - Inflorescence spicate. . . . . .
    - Spikes 2-ranked.
      - Glumes 1 (in the top spikelet 2). . *Lolium.* 44
      - broad, 2 in each spikelet. . . *Triticum.* 41
      - Gl. subulate, . collateral. Spikelets in 2s, &c. *Elymus.* 45
      - opposite. Spikelets solitary. *Secale.* 42
      - paniculate. Scarcely awned. *Dactylis.* 39
      - digitate. Paleæ awnless. *Eleusine.* 40
    - Spikes unilateral,
      - Spikes terminal, digitate, pistillate at base. . *Tripsacum.* 50
      - Spikes lateral, pistillate; panicle term. staminate. *Zea.* 51
- Stem solid with pith. Monœcious.

Tribe 1. STIPACEÆ.

Inflorescence panicled. Spikelets solitary, 1-flowered. Glumes membranaceous. Paleæ mostly two, lower one coriaceous, involute, awned.

1. ARISTI'DA.

Glumes 2, unequal; paleæ pedicellate, lower one with 3 awns at the tip, upper one very minute or obsolete.

1. A. DICHO'TOMA. *Poverty Grass.*

Cæspitose; *stem* dichotomously branching; *panicle* contracted-racemose; *lateral awns* very short, the intermediate one nearly as long as the paleæ, contorted. A slender grass, in sandy soils. Stems 8—12 inches high, branching at each joint. Leaves very narrow, with very short, open sheaths, and a very short stipule. Spikelets slender, on clavate peduncles. Aug.

2. A. PURPURA'SCENS. *Poir.*

Stem erect, simple, filiform, 2—3 feet high; *leaves* very narrow, flat, erect, a foot in length, with short, open sheaths; *panicle* long, loosely spicate; *spikelets* on short clavate, appressed pedicels; *awns* nearly equal, divaricate, twice the length of the paleæ; *paleæ* often dark purple. Sandy woods. Sept.

3. A. GRA'CILIS. *Ell.*

Stem very slender, a foot or more high; *leaves* setaceous, erect, with short sheaths, pilose at the throat; *panicle* very slender; *spikelets* somewhat remote, appressed; *lateral awns* short, erect, intermediate one longer, spreading. Mass. A grass of little value, as well as the other species.

2. STIPA.

Glumes 2; paleæ mostly 2, shorter than the glumes, the lower with a long awn at the apex, the upper entire; awn jointed at the base, deciduous; caryopsis striate.

1. S. AVENA'CEA. *Feather Grass.*

Stem naked above, 2—3 feet high; *leaves* smooth, striate, setaceous, chiefly radical; *panicle* spreading, somewhat 1-sided, 4—6 inches long, at length diffuse, branches capillary, solitary and in pairs; *glumes* nearly equal, mucronate, as long as the dark brown, cylindric fruit; *scales* 2, lanceolate. Sandy soils. Mass. N. Y. June.

2. S. CANADE'NSIS.

Leaves setaceous; *panicle* small; *glumes* smooth, ovate-obtuse, as long as the pubescent fruit; *awn* thick and short. Amherst, Mass. Neither this nor the preceding species is common or of much value in agriculture.

3. PIPTA'THERUM.

Glumes longer than the elliptic paleæ; scales ovate, entire.

P. NIGRUM. *Torr.* *Black-seeded Millet.* Oryzopsis melanocarpa. *Muh.*

Stem erect, simple, leafy, 18—24 inches high; *panicle* simple, flexuous, few-flowered; *spikelets* racemose, ovoid-lanceolate; *glumes* acuminate, mucronate, smooth; *paleæ* hairy, nearly black when ripe, the lower one tipped with an awn an inch in length; *fruit* black. Rocky hills. Aug.

4. ORYZO'PSIS.

Glumes 2, subequal, loose, obovate, awnless; paleæ 2, cylindric-ovate, hairy at base; scales linear-elongated.

O. ASPERIFO'LIA. *Mx.* *Mountain Rice.*

Stem nearly naked, purple at base, 10—20 inches high; *leaves* subradical, erect, rigid, pungent at the point, nearly as long as the stem, cauline ones few and very short; *spikelets* in a racemose, simple, flexuous panicle, 1—2 upon each branch; *glumes* abruptly acuminate; *paleæ* white, the lower one with a long bent awn. Woods. Leaves green through the winter. Caryopsis white, about as large as rice, farinaceous. May.

TRIBE 2. AGROSTIDEÆ.

Inflorescence panicled, rarely spiked. Spikelets solitary, 1-flowered. Glumes and paleæ of nearly similar texture, usually carinate.

5. AGRO'STIS.

Inflorescence paniculate; glumes 2, acute, subequal, the lower one larger; paleæ 2, unequal, the lower one larger, awnless or awned, larger than the glumes.

* Paleæ awnless.

1. A. VULGA'RIS. *L.* *Red-top.* *Bent Grass.* A. polymorpha. *Gray.*

Stem erect, 1—2 feet high; *panicle* spreading, with the branches finally divaricate; *leaves* linear-lanceolate, nerved, scabrous, with smooth, striate sheaths, and short, truncate stipules; lower palea twice as large as the upper, and nearly as long as the lanceolate, acute glumes. A common grass, spread over hills, vales and meadows, forming a soft dense turf. Flowers very numerous, purplish. July. Introduced.

2. A. ALBA. *L.* *White-top.* *Florin Grass.* A. decumbens. *Muh.*

Stem decumbent, geniculate, rooting at the lower joints, sending out stolons; *leaves* linear-lanceolate, smooth, those of the stolons erect and subulate; *sheaths* smooth, with a long, membranaceous stipule; *panicle* dense, narrow, at length spreading, whitish, sometimes purplish; *lower palea* 5-nerved, rarely awned. In meadows, or in dry soils, hence its characters are variable, being often nearly erect. June. Introduced.

3. A. LATERIFLO'RA. *Mx.* Muhlenbergia. *Gray.*

Stem erect or ascending, with swelling nodes, much branched and leafy above, often nearly leafless below, 1½—3 feet high; *leaves* lanceolate, scabrous, with half-clasping sheaths; *panicles* numerous, terminal and lateral, narrow and dense-flowered, lateral ones partly enclosed in the sheath; *glumes* narrow, acuminate, mostly shorter than the subequal, pubescent paleæ. Wet shades. Aug.

β. filiformis (*Torr.* A. filiformis. *Muh.*); *stem* erect; *panicles* very slender; *paleæ* scarcely longer than the glume.

4. A. SOBOLI'FERA. *Muh.* Muhlenbergia. *Gray.*

Stem erect, slender, producing shoots at base, sparingly branched, 18—30 inches high; *branches* erect and filiform; *nodes* not swelling; *leaves* linear-lanceolate, with open sheaths; *panicle* simple, filiform, with appressed branches, and crowded spikelets; *paleæ* equal, longer than the acute glumes. Rocky hills. Aug.

5. A. VIRGI'NICA. *L.* Vilfa vaginiflora. *Gray.*

Stems numerous, assurgent, procumbent and hairy at base, nearly simple, about a foot long; *leaves* somewhat 2-rowed, involute, rigid, erect, 2—3 inches long, with smooth sheaths which are hairy at the throat and swollen with the enclosed panicles; *panicles* spike-form, terminal and lateral, the lateral ones concealed; *glumes* nearly equal, about as long as the subequal paleæ. Sandy soils. Sept. Oct.

6. A. LONGIFO'LIA. *Torr.*

Stem erect, simple, 2—4 feet high; *leaves* 2 feet long, filiform at the end, with smooth, closed sheaths and bearded stipules; *panicles* terminal and lateral, contracted into a spiked form, generally concealed in the swelling sheaths; *glumes* much shorter than the subequal, smooth, spotless paleæ. Sandy fields. Sept. Oct.

** Paleæ awned.

7. A. CLANDESTI'NA. *Spreng.*

Stem terete, rigid, erect, smooth, about 2 feet high; *leaves* very long, rigid, glaucous, scabrous on the margin; *panicle* contracted, chiefly concealed; *paleæ* unequal, much longer than the glumes, slightly awned, hairy and spotted. Dry hills. Sept.

8. A. SYLVA'TICA. *Torr.* Muhlenbergia. *Gray.*

Stem ascending, 2—3 feet long, much branched, diffuse, smooth, with swelling nodes; *leaves* lanceolate, scabrous, nerved, 4—6 inches long, with smooth, open sheaths; *panicles* slender, rather dense; *glumes* nearly equal, acuminate, a little shorter than the paleæ; *awn* several times longer than the spikelet. Rocky shades. Sept.

9. A. TENUIFLO'RA. *Willd.* Muhlenbergia. *Gray.*

Stem erect, subsimple, pubescent at the nodes, with a few appressed branches; *leaves* 6—9 inches long, 2—3 lines wide, lanceolate, nerved, scabrous, spreading, with pubescent sheaths; *panicle* contracted, very slender and long, with remote, filiform branches; *glumes* subequal, acuminate, half as long as the paleæ; *awn* 3—4 times the length of the spikelet. Rocky woods. July. Aug.

10. A. CANI'NA. *Dog's Bent Grass.*

Stem prostrate, somewhat branched, rooting at the lower nodes, about 2 feet long; *panicle* at length spreading, with angular, rough branches; *glumes* elongated; *lower paleæ* furnished with an incurved awn upon the beak twice its length. Introduced and common in wet meadows. July.

11. A. STRICTA. *Bent Grass.*

Stem erect, smooth, with black nodes; *leaves* linear-lanceolate, scabrous on the margin, with cleft, white stipules; *panicle* elongated, strict, the branches about 5, flexuous, scabrous, erect; *glumes* equal, lanceolate; *paleæ* unequal, smaller than the glumes, with an awn at the base of the outer one longer than the flower. Fields. June.

12. A. CRYPTA'NDRIA. *Torr.*

Panicle pyramidal, with spreading, generally alternate branches, hairy at the axils; *flowers* subracemed; *lower glume* very short, upper one as long as the nearly equal paleæ; *stems* 3 feet high; *sheaths* bearded at the throat. Very abundant at Buffalo. *Atkin.*

6. POLYPO'GON.

Inflorescence contracted into a spike; glumes 2, nearly equal, obtuse, with long awns; paleæ shorter than the glumes, lower one entire, with a short, straight, tender awn (sometimes awnless), upper one bifid, toothed.

P. GLOMERA'TUS. *Willd.*

Stem compressed, erect, smooth, with appressed branches, 3—4 feet high; *leaves* somewhat 2-rowed, erect, flat, rough, 3—5 inches long, with closed sheaths; *panicle* dense, conglomerated, interrupted, 2—3 inches long, many-flowered; *glumes* linear, $\frac{1}{3}$ the length of their awns; *lower paleæ* mucronate. Bog meadows. Aug. Sept.

7. TRICHO'DIUM.

Inflorescence a capillary panicle; glumes 2, subequal, narrow and acute; palea 1, awnless, shorter than the glumes, loosely enclosing the caryopsis.

1. T. LAXIFLO'RUM. *Mx.* *Vanity or Hair Grass.*

Stem erect, smooth, very slender, 1—2 feet high; *leaves* 3—6 inches long, linear-lanceolate, scabrous, lower ones involute, upper ones shorter and flat; *sheath* rather open; *panicle* diffuse, with long, capillary, verticillate branches trichotomously divided near the end; *spikelets* in terminal clusters, purple; *glumes* linear-lanceolate. Pastures and roadsides, forming a dense turf. Jn.

2. T. SCABRUM. *Muh.* *Rough Hair Grass.*

Stem geniculate at base, assurgent, branched, 1—2 feet high; *leaves* rough, striate, linear-lanceolate, 4—6 inches long, with the sheaths commonly closed and smooth; *panicle* long, with verticillate, divaricate, dichotomously divided branches which are much shorter than in *T. laxiflorum.* Spikelets pale green, not clustered. Common in dry soils. July.

8. MUHLENBE'RGIA.

Panicle nearly simple; glumes 2, very minute, unequal, fringed; paleæ many times longer than the glumes, linear-lanceolate, nerved, hairy at base; the lower one terminating in a long awn.

Named in honor of the late Henry Muhlenberg, D. D., no less distinguished as a botanist than as a philanthropist.

1. M. DIFFU'SA. *Dorp-seed Grass.*

Stem decumbent, diffuse, branching, slender, compressed; *branches* assurgent; *leaves* 2—3 inches long, 2 lines wide, linear-lanceolate, rough, with smooth, striate, open sheaths; *panicles* terminal and lateral, with remote, appressed, rough branches; *spikelets* pedicellate, often purple; *awn* about as long as the palea. Borders of woods and fields. Aug.

2. M. ERE'CTA. *Schreb.*

Stem erect, simple, retrorsely pubescent at the nodes, 2—3 feet high; *leaves* lanceolate, scabrous, ciliate on the margin, 4—6 inches long, 3 or more lines wide, with somewhat open sheaths; *panicle* terminal, simple racemose, contracted; *spikelets* pedicellate, large; *glumes* very unequal, upper one subulate; *lower palea* half as long as its awn, *upper palea* with a short awn at base lodged in the dorsal groove. Rocky hills. July.

9. CINNA.

Glumes 2, subequal, compressed, without involucre or awns, upper one 3-nerved; paleæ 2, naked at base, on short stipes, lower one larger, enclosing the upper, with a short awn a little below the tip; stamen 1.

C. ARUNDINA'CEA.
Stem simple, erect, smooth, 3—5 feet high; *leaves* linear-lanceolate, 12—18 inches long, 3—5 lines wide, nerved, pale green, rough-edged, with smooth, striate sheaths; *stipule* long, lacerated; *panicle* near a foot in length, rather attenuated above and nodding, with the branches capillary and arranged somewhat in 4s; *glumes* linear-lanceolate; *lower palea* with a short, straight awn a little below the tip. A beautiful grass, sought by cattle, in rich, shady soils. Aug.

10. TRICHO'CHLOA.

Glumes 2, very minute; paleæ many times longer than the glumes, naked at base, lower one convolute at base, terminating in a long, unarticulated awn.

T. CAPILLA'RIS. *Dc. Hair Grass.*
Cæspitose; *stems* erect, very slender and smooth, 18—24 inches high; *leaves* erect, becoming filiform towards the end, 1—1½ foot long; *panicle* diffuse, with the branches 1—4 inches long, in pairs, and as fine as hairs; *spikelets* purple; *lower palea* produced into an awn 3 or 4 times its length. An exceedingly delicate grass, with large, purple, glossy and almost gossamer-like panicles, waving in the breeze. Sandy soils. Jn. Jl.

11. PSAMMA.

Panicle spicate; glumes 2, awnless; paleæ 2, shorter than the glumes, surrounded with hairs at base; scales linear-lanceolate, longer than caryopsis; styles 3-parted; stig. 3.

P. ARENA'RIA. *P. de B. Mat Grass.* Arundo arenaria. *L.*
Root creeping extensively; *stem* erect, rigid, 2—4 feet high; *leaves* involute, a foot in length, ½ inch wide, smooth and glaucous, pungently acute; *sheaths* smooth; *stipule* oblong; *panicle* dense, with erect, appressed branches, 6—10 inches long, and an inch thick; *spikelets* compressed, greenish white; *lower palea* longer than the upper. On sandy sea-coasts. At Dorchester, Mass., this grass is extensively manufactured into paper. Aug.

12. CALAMAGRO'STIS.

Panicle contracted; glumes 2, subequal, acute or acuminate; paleæ 2, mostly shorter than the glumes, surrounded with hairs at base, lower one mucronate, mostly awned below the tip, the upper one often with a stipitate pappus at base.

1. C. CANADE'NSIS. *Beauv. Reed Grass.* C. Mexicana. *Nutt.* Arundo. *Mx.*
Stem smooth, erect, rigid, 3—5 feet high; *leaves* linear-lanceolate, striate, with smooth, nerved sheaths; *panicle* erect, rather loose, oblong, the branches capillary, aggregated in 4s and 5s; *glumes* very acute, smoothish, much longer than the paleæ; *lower palea* bifid at the apex, with an exserted awn arising from below the middle of the back. Wet grounds. Common. Aug

2. C. COARCTA'TA. *Torr.* C. Canadensis. *Natt.*
Glaucous; *stem* erect, 2—4 feet high; *leaves* linear-lanceolate, scabrous, with the nerves and keel white; *sheaths* striate; *stipule* oblong, obtuse; *panicle* condensed and spike-form, the branches rigidly erect, short and aggregated; *glumes* acuminate, lanceolate, lower 1-nerved, upper 3-nerved; *lower palea* 5-nerved, bifid at the apex, with a short, straight awn a little below the tip. Bogs. July. Aug.

TRIBE 3. PHLEOIDEÆ.

Inflorescence in dense, cylindric or unilateral spikes. Spikelets 1-flowered. Glumes 2, of nearly similar texture with the paleæ.

13. ALOPECU'RUS.

Glumes subequal, connate, distinct; paleæ united into an inflated glume, cleft on one side below the middle, generally awned; styles often connate.

1. A. PRATE'NSIS. *Fox-tail Grass.*
Stem erect, smooth, leafy, about 2 feet high bearing an erect, dense, many-flowered, cylindric, obtuse, paniculate spike, about 2 inches long; *leaves* flat, smooth, with swelling sheaths and ovate stipules; *glumes* ciliate, connate below the middle, as long as the paleæ; *awn* twisted, scabrous, twice the length of the flower. Fields and pastures. An excellent grass. Jn. Jl.

2. A. GENICULA'TUS.
Stem ascending, geniculate, rooting below, sparingly branched, 1—2 feet high; *spike* cylindrical, about 2 inches long; *leaves* linear-lanceolate, smooth, flat, acute, a few inches in length, with slightly inflated sheaths, and long, entire stipules; *glumes* slightly connate at base, hairy outside; *paleæ* truncate, smooth, half as long as the geniculate awn Wet meadows. Jn.
β. aristulatus (*Torr.* A. aristulatus. *Mx.*); *awns* very short.

14. PHLEUM.

Glumes 2, equal, carinate, much longer than the paleæ, rostrate or mucronate; paleæ 2, included in the glumes, truncate, awnless.

P. PRATE'NSE. *Timothy or Herd's Grass.*
Stem erect, simple, terete, smooth, 2—4 feet high; *leaves* linear-lanceolate, flat, glaucous, roughish; *sheaths* striate, smooth; *stipule* obtuse, lacerated; *glumes* apparently bicuspidate, in a dense, long, cylindric, green spike; *anthers* purple; *stigmas* white. This is probably the most valuable of all grasses. Introduced and extensively cultivated. Jl.

15. SPARTI'NA.

Spikelets imbricated in a double row in unilateral, paniculate spikes; glumes 2, unequal, compressed; paleæ 2, subequal, compressed, awnless; style long, bifid.

1. S. CYNOSUROI'DES.
Stem slender, smooth, 3—5 feet high; *leaves* 2—3 feet long, sublinear, convolute and filiform at the end; *sheaths* striate, glabrous; *panicle* loose, slender, composed of 20 or more alternate, one-sided, pedunculate spikes 2—3 inches long; *spikelets* arranged on 2 sides of a triangular rachis; *glumes* acuminate, one of them with a short awn; *paleæ* white and awnless. Marshes. A coarse, sedge-like grass. Aug.

2. S. JU'NCEA.

Root creeping extensively; *stem* erect, rigid, round, smooth, 1—2 feet high; *leaves* convolute at the edges, spreading, in 2 rows; *spikes* 3—5; *peduncles* smooth; *rachis* compressed; *lower glume* 3 times as long as the upper; *paleæ* obtuse, lower one shorter; *styles* 2. Marshes and river banks. Jl. Aug.

3. S. GLABRA. *Muh.*

Stem smooth, succulent, terete, 3—5 feet high; *leaves* concave, erect, about 2 feet long, ½ inch wide at base, tapering to a long acumination; *spikes* 10—15, erect and appressed, alternate and sessile upon a triangular rachis; *spikelets* in a dense, double row. Marshes. Aug. Sept.

TRIBE 4. PANICEÆ.

Inflorescence spiked or panicled. Spikelets 1 or (more usually) 2-flowered, one of the flowers being sterile or imperfect. Glumes usually (membranaceous) of a thinner texture than the paleæ, which are more or less cartilaginous, the lower palea half enfolding the upper, sometimes awned.

16. PA'SPALUM.

Flowers in unilateral spikes; glumes 2, membranaceous, equal, suborbicular, closely pressed to the 2 paleæ; stigmas plumose, colored; caryopsis coated with the smooth, plano-convex paleæ.

1. P. CILIATIFO'LIUM. *Mx.*

Stem decumbent, simple, slender, 1—2 feet long; *leaves* flat, hairy and ciliate, about 6 inches long, with hairy sheaths; *spike* 1 (or 2, the second being smaller than the other), terminal, on a long peduncle, somewhat loosely 3-rowed; *spikelets* pedicellate, appressed, plano-convex. Sandy fields, not common. Sept.

2. P. SETA'CEUM. *Mx.*

Stem erect, slender, smooth and purplish below, 1—2 feet high; *leaves* linear-lanceolate, hairy both sides; *sheaths* nerved, smooth, villous at the throat; *spike* mostly solitary, on a very long, terminal peduncle, often with another on a short peduncle from the same sheath; *spikelets* plano-convex, alternate, in 2 rows, with the flat side out. Sandy fields. Aug.

17. MI'LIUM.

Inflorescence paniculate; spikelets 1-flowered; glumes 2, without involucre or awns; paleæ 2, shorter than the glumes, awnless, oblong, concave, persistent and cartilaginous, coating the caryopsis.

1. M. EFFU'SUM. *Spreading Millet Grass.*

Stem erect, simple, smooth, 5—8 feet high, bearing a compound, diffuse panicle; *leaves* flat, 8—12 inches long, ½—1 inch wide, on smooth, striate sheaths; *branches of the panicle* clustered, horizontal, 1—6 inches long; *spikelets* ovate, few and scattered; *paleæ* smooth and polished. Woods. Plant pale green. Summer.

2. M. PUNGENS. *Torr. Dwarf Millet Grass.*

Stem erect, simple, rigid, 12—18 inches high; *leaves* lanceolate, *cauline* very short, pungent, at length involute, *radical* 6—8 inches long, erect, acute and pungent; *sheaths* striate, rough, tumid; *panicle* contracted, few-flowered; *peduncles* bifid; *glumes* awnless; *paleæ* hairy, about equaling the glumes; *style* 2-parted. May.

18. PA'NICUM.

Glumes 2, unequal, the lower mostly very small; flowers 2, dissimilar, the lower abortive or sterile, with 1—2 paleæ, the

upper palea membranaceous; the upper perfect, with the paleæ cartilaginous, equal, concave, awnless, coating the caryopsis.

* Spikelets in racemose panicles.

1. P. CRUS-GALLI. *Cocksfoot Grass.*

Root annual; *stem* terete, smooth, 3—4 feet high; *leaves* linear-lanceolate, flat, serrulate, with smooth, striate sheaths and no stipule; *racemes* dense, spike-form, compound, alternate and in pairs; *rachis* hairy and rough; *glumes* hispid with bristles; *lower abortive palea* ending in a long, rough awn. A coarse, weedy grass, introduced into cultivated grounds. Aug. Sept.

2. P. HIS'PIDUM.

Stem thick, 3—4 feet high; *leaves* broad, flat; *panicle* compound, nodding, dense, 4—6 inches long, with alternate racemes; *flowers* always awned. Salt marshes. Best distinguished from the preceding by its hispid sheaths. Sept. Oct.

3. P. AGROSTOI'DES.

Stem compressed, glabrous, 2—3 feet high; *leaves* very long and numerous, *cauline* linear-lanceolate, carinate, rough-edged, on short, striate sheaths; *panicles* terminal and lateral, pyramidal, composed of racemed branches; *spikelets* small, lanceolate, acute, crowded and appressed; *upper glume* 5-nerved; *paleæ* of the neutral flower nearly equal. Meadows. Common. July.

4. P. ANCEPS.

Stem compressed, 2—3 feet high; *leaves* linear, carinate, very long; *sheaths* ancipital, pilose on the throat and margin; *panicle* erect, contracted, with nearly simple branches; *spikelets* interruptedly racemose, very acuminate; *upper palea* of the neutral flower oblong, obtuse or emarginate. Fields and meadows. Common. July.

5. P. PEDUNCULA'TUM. *Torr.*

Stem dichotomously branched above, round, 3—4 feet high; *leaves* $\frac{3}{4}$ inch wide, tapering to the point; *sheaths* hispid and papillose; *panicle* compound, smooth, on a long peduncle, *branches* in pairs, racemed; *spikelets* ovate, smooth; *upper palea* of the abortive flower half as long as the lower. Moist woods. July.

6. P. INVOLU'TUM. *Torr.*

Stem cæspitose, simple or sparingly branched at base, a foot high; *leaves* erect, very narrow, somewhat rigid, at length involute; *panicle* simple, few-flowered, flowers acuminate; *upper palea* of the neutral flowers very small. Deerfield, Mass.

7. P. DEPAUPERA'TUM. *Muh.*

Cæspitose; *stem* hairy at the joints, about a foot high; *leaves* linear-lanceolate, smooth or hairy, lower ones shorter than the upper; *sheaths* pubescent; *panicle* few-flowered, terminal, erect, branches tortuous, in pairs, one of them 2-flowered, the other 1-flowered. Barren soils. May, June.

8. P. PROLI'FERUM. *Lam.* P. geniculatum. *Muh.*

Stem assurgent, geniculate at base, very smooth, thick and succulent; *leaves* linear-lanceolate, 4—6 lines wide, 10—15 inches long, on tumid sheaths hairy at throat; *panicles* large, pyramidal, terminal and axillary, smooth; *spikelets* racemose; *abortive flower* with one palea. Wet meadows. Sept.

* * Spikelets in loose panicles.

9. P. CLANDESTI'NUM.

Stem with short, axillary, appressed branches, 2—3 feet high, rigid, leafy; *leaves* 3—6 inches long, an inch broad, lanceolate, subcordate at base; *sheaths* hispid, enclosing the short, lateral panicles; *upper palea* of the neutral flower obtuse. Moist woods. July. Aug.

10. P. LATIFO'LIUM.

Stem nearly simple, with the nodes retrorsely pilose; *leaves* lance-ovate, clasping, somewhat pubescent; *panicle* terminal, a little exserted from the sheath, simple, pubescent; *spikelets* rather large, oblong-ovate; *abortive flower* staminate. Common in ditches, woods, &c. Jn. Jl.

11. P. NERVO'SUM.

Stem simple, smooth at the nodes, 3—4 feet high; *leaves* broad-lanceolate, smooth, a little ciliate on the margin, cordate at base, an inch wide with short sheaths; *paniele* much branched, smooth, many-flowered, pedunculate or sessile, branches flexuous, somewhat spreading; *spikelets* oblong; *abortive flower* staminate. Bogs. July.

12. P. DICHO'TOMUM. *Ph.*

Stem much branched and dichotomous above, erect or decumbent, 1—2 feet high, branches fasciculate; *leaves* linear-lanceolate, smooth, very numerous, 1—2 inches long, ciliate at base; *panicles* lateral and terminal, simple, capillary, with loose, spreading branches; *spikelets* minute, ovoid-obtuse. Woods. Variable. July.

13. P. NI'TIDUM. *Lam.*

Stem erect, simple or branched, slender; *leaves* few, remote, broad-linear; *sheaths* bearded at the throat; *panicle* capillary, terminal, smooth, the branches few or numerous, somewhat verticillate; *spikelets* small, oblong-ovoid, pubescent; *lower glume* very small. This species appears to be liable to much variation, and several forms are described differing in the degree of pubescence, the more or less expanding panicle, and in the stem being simple or more or less branched. Woods and meadows. Jn. Jl.

14. P. MACROCA'RPON. *Torr.*

Stem erect, simple, straight, 2—3 feet high; *leaves* linear-lanceolate, erect, subpilose beneath, 3—6 inches long; *sheaths* hispid, villous on the margin, with no stipules; *panicle* rather compound, smooth, with few, spreading, flexuous, subsimple branches; *spikelets* ovoid-globose; *abortive flower* neutral. Banks of Connecticut river. Mass. July.

15. P. CAPILLA'RE.

Stem nearly simple, assurgent at base, 1—2 feet high; *leaves* hairy, broad-linear, acuminate, 4—6 inches long; *sheaths* covered with hispid hairs; *panicle* large, pyramidal, capillary, loose, expanding; *spikelets* small, lanceolate, acuminate, smooth, on long, hispid peduncles; *abortive flower* of 1 palea. Fields and roadsides. Aug.

16. P. VERRUCO'SUM.

Stem slender, decumbent and geniculate, branching from the base, 1—2 feet high; *leaves* linear, a few inches long, spreading, smooth; *panicle* much expanded, few-flowered, flowers verrucose; *abortive flower* of one palea, and neuter. Swamps and thickets. Panicle terminal and lateral, loose and capillary. Aug.

17. P. VIRGA'TUM.

Glabrous and often purple; *stem* 3—5 feet high; *leaves* long, linear-lanceolate, hairy at base; *sheaths* striate; *stipule* with long, white ciliæ; *panicle* virgate, at length spreading, diffuse, very large; *flowers* acuminate; *paleæ* of the abortive flower nearly equal, enfolding the purple stamens. Banks of streams. Not common. Aug. None of these species are of much value in agriculture.

19. DIGITA'RIA.

Inflorescence digitate or fasciculate; spikes linear, unilateral; spikelets in pairs, on short, bifid pedicels, 2-flowered; glumes 2, the lower very small, sometimes wanting; lower

flower abortive, with a single, membranaceous palea; upper flower perfect, with 2 cartilaginous, subequal paleæ; caryopsis striate.—Root annual.

1. D. SANGUINA'LIS. *Purple Finger Grass. Crab Grass.*
Stems decumbent at base, radiating and branching at the lower joints, 1—2 feet long; *leaves* linear-lanceolate, on long, loose sheaths, softly pilose, the sheaths strigosely hairy; *spikes* 3—5 inches long, fasciculate at the top of the stem, 5—9 together; *spikelets* in pairs, oblong-lanceolate, closely appressed to the rachis, in 2 rows. Common in cultivated grounds. Aug.—Oct. Ann.

2. D. GLABRA.
Stem generally decumbent, rarely rooting at the joints, a foot long; *leaves* short, flat, nearly glabrous; *spikes* digitate, spreading, 3—4; *spikelets* crowded, ovoid; *glume* equaling the abortive flower, both hairy. Sandy fields. Aug. Sept.

3. D. FILIFO'RMIS.
Stem erect, filiform, simple, 12—18 inches high; *leaves* short, nearly smooth, narrow-lanceolate; *spikes* 2—4, filiform, erect; *spikelets* in 3s, all pedicellate; *glume* solitary, as long as the abortive flower. Dry, gravely soils. Aug.

20. SETA'RIA.

Inflorescence a compound, cylindrical spike; spikelets 2-flowered, invested with an involucre of 2 or more bristles; glumes, flowers, paleæ and fruit as in the genus *Panicum*.

1. S. VI'RIDIS. *Wild Timothy.*
Stem smooth, 2—3 feet high; *leaves* lanceolate, flat, minutely serrulate; *sheaths* striate, hairy on the margin, and with a setose stipule; *spike* cylindric, compound, terminal, green; *involucre* of 4—10 fasciculate bristles, much longer than the spikelets; *paleæ of the perfect flower* longitudinally striate, punctate. Common in cultivated grounds. July. Aug.

2. S. GLAUCA. *Bottle Grass.*
Stem 2—3 feet high; *leaves* lanceolate, carinate, rough, hairy at base; *sheaths* striate, smooth; *stipule* setose; *spike* cylindric, yellowish green, 2—4 inches long; *involucre* of 6—10 fascicled, scabrous bristles much longer than the spikelets; *paleæ of the perfect flower* transversely rugose. Fields and roadsides. July. Aug.

3. S. VERTICILLA'TA.
Stem smooth, about 2 feet high; *leaves* lanceolate, rough-edged; *sheaths* smooth, hairy on the margin; *spicate panicle* composed of short, divided branches in interrupted verticels, 2—3 inches long; *bristles of the involucre* in pairs, rough backwards; *paleæ of the perfect flower* roughish punctate. Sandy fields. July.

4. S. ITA'LICA.
Stem somewhat compressed, about 4 feet high; *leaves* lanceolate, 1—2 feet long, an inch wide; *sheaths* roughish, pilose at the throat; *spike* compound, interrupted at the base, nodding, 6—8 inches long; *spikelets* conglomerate; *involucre* of 2 bristles, several times longer than the flower. Ditches. July.

TRIBE 5. PHALARIDEÆ.

Inflorescence a contracted panicle. Spikelets solitary, with 1 perfect flower and 1—2 imperfect ones. Lower palea awned or mucronate, upper with 2 keels.

21. PHA'LARIS.

Spikelets 1-flowered; glumes 2, subequal, carinate; paleæ 2, coriaceous, awnless, shorter than the glumes, coating the

caryopsis, each with an external, accessory palea or abortive rudiment at base.

1. P. ARUNDINA'CEA. *L.* P. Americana. *Torr.*

Stem erect, sparingly branched, 2—5 feet high; *leaves* spreading, lanceolate, nerved, rough-edged, on smooth, striate sheaths; *panicle* oblong, spicate, somewhat secund, 2—4 inches long; *glumes* 3-nerved, whitish, scabrous; *rudiments* pilose. Common in ditches and swamps. July. Aug.

β. picta is the well known striped or ribbon grass, with beautifully variegated leaves longitudinally striped in endless diversity. Cultivated.

2. P. CANARIE'NSIS. *Canary Grass.*

Stem erect, or geniculate at the lower joints, round, striate, leafy; *leaves* lanceolate; *panicles* spicate, ovoid, erect; *glumes* whitish, with green nerves; *rudiments* smooth. Fields and pastures. Introduced. July. Ann.

22. HOLCUS.

Spikelets 2-flowered; glumes herbaceous, boat-shaped, mucronate; flowers pedicellate, the lower one perfect and awnless. upper one staminate or neuter, awned on the back.

H. LANA'TUS. *Soft Grass.*

Hoary pubescent; *stem* 1½—2 feet high; *leaves* lanceolate, 2—5 inches long; *sheaths* striate; *panicle* oblong, dense, whitish with a purple tinge; *flowers* shorter than the glumes, sterile one with a recurved, included awn. Common in wet meadows. Very soft with whitish down. Jl.

23. HIERO'CHLOA.

Spikelets 3-flowered; glumes 2, scarious; lateral flowers staminate, triandrous; central flower perfect, diandrous (rarely triandrous).

1. H. BOREA'LIS. *Seneca Grass.*

Smooth, glossy; *stem* simple, erect, 15—20 inches high; *radical leaves* as long as the stem, cauline 2—4 inches long, lanceolate, mucronate; *panicle* rather 1-sided and spreading, pyramidal, few-flowered, 2—3 inches long; *branchlets* flexuous; *spikelets* broad, subcordate, colored, unarmed; *lower palea* ciliate. Wet meadows. Very fragrant. May.

2. H ALPI'NA.

Smooth; *stem* erect, stout, 6—8 inches high; *leaves* linear-lanceolate, acute; *sheaths* tumid, longer than the internodes; *panicle* ovoid, 1½—2 inches long, with the branches in pairs; *spikelets* purple, compressed, large, longer than the branches; *glumes* lanceolate; *lower flower* with an awn about as long as the paleæ. Summits of the White Mts. *Bw.* Jn.

24. ANTHOXA'NTHUM.

Spikelets 3-flowered, the central one perfect, the 2 lateral ones neuter, each consisting of one bearded palea; glumes 2, unequal, the upper one larger. enclosing the flowers; paleæ of the perfect flower 2, short, awnless; stamens 2.

A. ODORA'TUM. *Sweet-scented Vernal Grass.*

Stem slender, erect, 12—18 inches high; *leaves* short, striate, pale green; *panicle* spicate, oblong-ovoid; *spikelets* pubescent, on short peduncles; *paleæ of the lateral flowers* linear-oblong, ciliate on the margin, one of them with a

bent awn from near the base, the other with a straight awn from the back near the summit. An early-flowering, deliciously fragrant grass. Introduced. May, June.

Tribe 6. AVENEÆ.

Inflorescence paniculate. Spikelets solitary, few-flowered. Glumes and paleæ of similar texture. Upper flowers generally pedicellate, with awn-like processes or abortive rudiments between the upper and the lower ones. Upper palea with 2 keels.

25. AI'RA.

Spikelets 2-flowered, without abortive rudiments; glumes 2, membranaceous and shining, subequal; one of the flowers pedicellate; paleæ subequal, pilose at base, the lower one lacerate at apex and awned on the back.

1. A. FLEXUO'SA.

Stem smooth, 1—2 feet high, nearly naked; *leaves* setaceous, smooth, with striate sheaths and truncate stipules; *panicle* loose, spreading, trichotomous, with long, flexuous branches; *awns* geniculate, longer than the paleæ. Vales and hills. Saddle Mt., Ms. An erect, elegant grass, growing in tufts. Jn.

2. A. CÆSPITO'SA.

Cæspitose, glabrous; *stem* 18—30 inches high; *leaves* narrow-linear, scabrous above, smooth beneath, flat; *panicle* pyramidal, capillary, oblong, finally diffuse; *awns* straight, about as long as the paleæ which are longer than the bluish glumes. Swamps. May.

26. TRISE'TUM.

Spikelet 2—5-flowered; glumes 2, as long as the flowers; lower palea with 2 bristles at the apex and a soft flexuous awn from above the middle of the back; scales ovate; fruit coated, furrowed.

1. T. PALU'STRE. *Torr.* Avena palustris. *Mx.*

Stem erect, contracted at the nodes, slender, smooth, about 2 feet high; *leaves* lance-linear, about 3 inches long, roughish, on smooth, striate sheaths; *panicle* oblong, contracted, nodding, yellowish green; *spikelets* 2—3-flowered, middle flower abortive, upper one pedicellate, its lower palea ending in 2 setose teeth, and awned below the tip, lower one mostly awnless. Wet meadows. May—July.

2. T. PURPURA'SCENS. *Torr.* Avena striata. *Mx.?*

Stem leafy, 2 feet high; *leaves* narrow-linear, keeled, 4—6 inches long and with the sheaths smooth; *panicle* very simple, almost a raceme, few-flowered, 4—6 inches long; *glumes* 3-flowered, very unequal, entire; *spikelets* lanceolate, terete, purple, smooth; *lower palea* 7-nerved, 2-cleft at the extremity; *awn* geniculate. Mountain bogs.

3. T. SUBSPICA'TUM. *Br.* T. aroides. *P. de B.* Aira. *L.*

Stem a foot high; *leaves* narrow, 2—4 inches long; *panicle* contracted into a spike 2 inches long; *awn* at length deflexed, longer than the glume. Rocks and mountains. Little Falls, N. Y. *Gray.* White Mts., N. H. *Pickering.* Jn.

27. URALE'PSIS.

Spikelets 2—3-flowered; glumes 2, shorter than the flowers; flowers stipitate and distinct; paleæ 2, very unequal, distinctly villous on the margins, the lower one tricuspidate, the central cusp setose; upper palea concave on the back; fruit gibbous, coated.

U. ARISTULA'TA.

Cæspitose; *stems* procumbent at base, bearded at the nodes, 10—18 inches high; *leaves* subulate, the upper ones shorter than the sheaths, hairy beneath; *panicles* simple, racemose, terminal and lateral, concealed in the sheaths of the leaves, the upper one partly exsert; *spikelet* 3-flowered; *awn of the palea* as long as the lateral cusps. Sea-coast and sandy fields. Aug. Ann.

28. AVE'NA.

Spikelets 2—5-flowered; glumes 2, loose and membranaceous, subequal, longer than the flowers; paleæ 2, mostly hairy at base, the lower one bifid, with a twisted or bent awn at the back.

1. A. ELA'TIOR. *L.* Arrhenatherum. *Beauv.*

Stem 2—4 feet high, geniculate, smooth; *leaves* lance-linear, rough on the margin and upper surface; *panicle* loose, equal, nodding, branches in pairs or ternate; *spikelets* 2-flowered; *awn* twice as long as the palea; *upper flower* perfect, mostly awnless. A tall grass, introduced and naturalized in cultivated grounds. May. June.

2. A. PENNSYLVA'NICA. *L.* Arrhenatherum. *Torr.*

Stem erect, smooth; *leaves* linear-lanceolate; *panicle* slender, with short, alternate branches; *awn* twice as long as the flowers, geniculate, from the base of the lower palea; *upper flower* awnless. Fields and open woods. Rare. July. Ann.

3. A. PRÆCOX. *P. de B.* Aira. *L.*

Cæspitose; *stem* erect, a few inches high; *leaves* ½—1 inch long, rough; *sheaths* deeply striate; *panicle* dense, racemose; *spikelets* ovate, 2-flowered, *glumes* as long as the flowers; *lower palea* with a bent awn from the lower part of the back twice its length. Ithaca, N. Y. *Eaton.* Sandy fields. Jn. Ann.

4. A. SATI'VA. *Common Oat.* *Stem* smooth. 2—4 feet high; *leaves* linear-lanceolate, nerved, rough, with loose, striate sheaths; *stipule* lacerate; *panicle* loose; *spikelets* pedunculate, pendulous, 2-flowered, both flowers perfect, the lower one mostly awned; *paleæ* somewhat cartilaginous, closely embracing the caryopsis. A highly important grain, one of the staple productions of the soil; said to have been first discovered in the Island of Juan Fernandez. Ann.

β. nigra; paleæ dark brown, almost black, awnless. *Black Oats.*

γ. secunda; panicle 1-sided; *awns short.* *Horse-mane Oats.*

5. A. STE'RILIS. *Animated Oat.* *Stem* 3—4 feet high, and with the leaves smooth, the latter long, acute, flat; *spikelets* 5-flowered, outer flowers and awns hairy, inner flowers awnless. From Barbary. Cultivated as a curiosity. The awns are 2 inches long, geniculate, and twisted more or less according to the state of the atmosphere. Hence the tumbling motion of these spikelets in the moist and warm hands, like a grotesque insect. Ann.

29. ARU'NDO.

Spikelets many-flowered; glumes 2, awnless, lanceolate, unequal; lower flower staminate and naked at base; the others perfect, pedicellate; paleæ unequal, the lower one mucronate, acuminate or slightly awned.

A. PHRAGMI'TES.

Stem smooth, stout, erect, 6—12 feet high, often an inch in diameter at base; *leaves* lanceolate, 1—2 feet long, 1—2 inches wide, rough-edged, smooth and glaucous; *panicle* large and loosely branched, branches in half whorls,

slender; *spikelets* 3—5-flowered, very slender, erect; *glumes* shorter than the flowers which are of a dark hue, with tufts of long, white, silky hairs. About ponds. July.

Tribe 7. FESTUCACEÆ.

Inflorescence panicled. Spikelets many-flowered, oblong. Flowers sessile, closely arranged in 2 rows on the rachis. Paleæ of similar texture with the glumes, the upper one with 2 keels.

30. DANTHO'NIA.

Spikelets 2—7-flowered; glumes 2, subequal, longer than the flowers, cuspidate; paleæ hairy at the base, lower one bidentate at the apex, with a twisted awn between the teeth, the upper one obtuse, entire.

D. SPICA'TA. *P. de B. Wild Oats.* Avena. *L.*

Stem slender, nearly erect, 12—18 inches high; *lower leaves* numerous, 4—6 inches long, flat, hairy above, *cauline leaves* much shorter, subulate, erect, on very short sheaths; *panicle* simple, spicate, short, erect; *spikelets* 3—8 or 10, about 7-flowered; *glumes* a little longer than the flowers; *lower palea* hairy, about half as long as its spirally twisted awn. Pastures and open woods. June—Aug.

31. BROMUS.

Spikelets 3—20-flowered; glumes 2, shorter than the flowers; lower palea cordate, bifid at the apex, usually awned a little below the tip, upper palea conduplicate, ciliate on the margin; scales ovate, smooth.

1. B. SECALI'NUS. *Chess.*

Stem smooth, erect, 3 feet high; *leaves* flat, rough at the edge and above; *sheaths* nerved, smooth; *stipule* laciniate; *panicle* spreading, the branches mostly simple, each bearing 1—2 spikelets; *spikelets* ovate, compressed, about 10-flowered, large, 2-ranked, oval, appearing not unlike short heads of rye. A handsome grass in fields, often among wheat. June. Ann.

2. B. MOLLIS. *Soft Brown Gruss.*

Stem erect, mostly pubescent, 1—2 feet high; *leaves* and *sheaths* downy-pubescent; *panicle* erect, close, compound, 3—4 inches long; *spikelets* oblong-ovate, slightly compressed, tomentose, 5—10-flowered; *flowers* elliptical; *lower palea* oblong-lanceolate, 7-nerved, with a straight awn nearly its length. A coarse grass, in fields and roadsides. June. July.

3. B. CILIA'TUS.

Stem slender, 3—4 feet high, bearded at the nodes; *leaves* hairy above, smooth beneath, ½ inch wide; *sheaths* downy; *panicle* drooping; *spikelets* oblong-lanceolate, terete, 8—10-flowered, with acute, ciliate glumes (not mucronate); *paleæ* hairy, villosely ciliate on the margin; *awn* short. Woods. Jn.

4. B. PURGANS.

Stem round, smooth, 3—4 feet high; *leaves* broad-linear, smooth and glaucous; *sheaths* pilose with reversed hairs; *panicle* nodding, with rough and flexuous branches; *spikelets* lanceolate, terete, 6—8-flowered; *flowers* hairy, with a straight awn. Meadows. July. Aug.

5. B. PUBES'CENS.

Stem striate, smooth above, hairy below, with black nodes, 2—4 feet high; *leaves* linear-lanceolate, hairy above, rough-edged; *upper sheaths* smooth, *lower ones* hairy; *panicle* loose, nodding, branches in clusters of 2—5, flexuous; *spikelets* lanceolate, 8—12-flowered; *flowers* pubescent, with short straight awns. Woods. Common. Jn.

32. FESTU'CA.

Spikelets oblong, acute at each end, subterete; glumes 2, unequal, shorter than the flowers; paleæ lanceolate, lower one acuminate or awned at the extremity.

1. F. TENE'LLA. *Slender Fescue Grass.*
Stem filiform, wiry, often growing in tufts and geniculate at base, 6—12 inches high; *leaves* erect, linear-setaceous, 2—3 inches long; *sheaths* subpubescent, with lacerated stipules; *panicle* simple, contracted, rather secund, branches alone or in pairs; *spikelets* 5—7-flowered, with subulate, subequal glumes, at length brownish; *flowers* subulate, longer than their awns. Sandy fields. June.

2. F. ELA'TIOR. *Tall Fescue Grass.*
Stem smooth, 3—4 feet high; *leaves* lanceolate, smooth, rough-edged, a foot long, on smooth, loose sheaths; *panicle* drooping, very branching, loosely spreading, branches in pairs; *spikelets* lance-ovate, acute, 4—6-flowered, racemose on the branches; *lower glume* shorter; *lower palea* acuminate or mucronate. A fine grass, in meadows. June.

3. F. PRATE'NSIS. *Meadow Fescue Grass.*
Stem smooth, 2—3 feet high; *leaves* lance-linear, nerved, smooth, rough-edged, about 8 inches long; *sheaths* nerved, smooth with obsolete stipules; *panicle* branched, spreading, somewhat 1-sided, branches subsolitary; *spikelets* lance-linear, 7—9-flowered; *lower glume* smaller; *lower palea* acute. Introduced in fields and meadows. June. July.

4. F. DURIU'SCULA. *Hard Fescue Grass.*
Stem smooth, 12—18 inches high; *leaves* linear, very acute, a little scabrous; *stipules* membranaceous, lacerate; *panicle* oblong, spreading, inclining to one side, branches in pairs; *spikelets* nearly terete, 5—7-flowered; *lower glume* smaller, *upper one* 3-nerved; *paleæ* unequal, *lower* with short awns. Fields and pastures. A fine grass. June. July.

5. F. NUTANS.
Stem erect, slender, smooth, with black nodes, about 3 feet high; *leaves* narrow-linear, a foot long, nerved; *panicle* slender, diffuse, at length nodding, branches in pairs; *spikelets* lance-ovate, 3—5-flowered; *flowers* smooth, awnless and nearly nerveless. Open woodlands. June.

6. F. FASCICULA'RIS.
Stem much branched from the base, with short internodes, procumbent, geniculate, 12—18 inches long; *leaves* linear, very long, 5-nerved, scabrous, on long, loose sheaths; *panicle* erect, inclining to one side, with strict, spike-form branches; *spikelets* appressed, secund, 8—10-flowered; *glumes* 1-nerved, lower one very short; *lower paleæ* tipped with awns of their own length. Wet meadows. Aug. Ann.

7. F. OVI'NA. *Sheep's Fescue.*
Stem erect, ascending at base, 6—10 inches high; *leaves* very narrow, rough, radical ones very numerous, 2—4 inches long, cauline few, short, erect; *panicle* few-flowered, simple, contracted; *spikelets* ovate, 4-flowered; *paleæ* roundish. A valuable grass, recently introduced. June.

33. KŒLE'RIA.

Spikelets compressed, 2—3-flowered; glumes 2, unequal, shorter than the flowers; upper flower pedicellate, with a short, awn-like rudiment at the base of the upper palea; paleæ 2, the lower awnless or awned beneath the tip.

1. K. TRUNCA'TA. *Torr.*
Stem slender, 2 feet high; *leaves* smooth, narrow, 4—6 inches long; *panicle* oblong, loose, racemose; *spikelets* 2-flowered, in clustered racemes, on short, suberect branches; *glumes* subequal, the lower one linear, upper one much broader, very obtuse or truncate; *paleæ* awnless. Fields and open woods. Jn.
β. *major*; *leaves* broad-linear, very long; *panicle* large, spreading.

2. K PENNSYLVA'NICA.
Stem smooth, 2—3 feet high, nodes black; *leaves* 1—2 inches long, narrow, flat, lower ones soft pubescent; *panicle* very slender, loose, 4—8 inches long; *spikelets* about 3-flowered, shining; *lower glume* linear, *upper one* much broader, oblanceolate, 3-nerved; *paleæ* awnless. Rocky woods. May. June.

34. TRICU'SPIS.

Spikelets terete, tumid, about 5-flowered; glumes 2, unequal, carinate, shorter than the flowers; lower palea bifid-toothed, tricuspidate by the projecting keel and two lateral nerves, upper one truncate, almost emarginate; caryopsis 2-horned.

T. SESLERIOI'DES. *False Red-top.*
Stem very hard and smooth, erect, 4—5 feet high; *leaves* smooth beneath, lance-linear, nerved, 12—18 inches long; *lower sheaths* often hairy; *stipules* 0; *panicle* loose, expanding, branches flexuous, smooth, long; *spikelets* ovate-lanceolate, purple, shining, 4—5-flowered; *glumes* unequal, mucronate; *lower palea* with 3 projecting nerves. A splendid grass in sandy fields. Aug.

35. GLYCE'RIA.

Spikelets slender, many-flowered; glumes 2, unequal, nerveless, truncate, shorter than the flowers; lower palea herbaceous, embracing the upper, bidentate one; scales connate, truncate.

1. G. FLU'ITANS. *Br.* Festuca fluitans. *L.*
Stem compressed or ancipitous, ascending at base, 3—5 feet high; *leaves* lance-linear, smooth beneath, about a foot long; *sheaths* nerved, smooth, with a very large stipule; *panicle* secund, long, slender, slightly branched; *spikelets* long, linear, appressed, about 10-flowered; *flowers* obtuse; *lower palea* 7-nerved, denticulate. Aquatic. June. July.

2. G. ACUTIFLO'RA. *Torr.*
Stem somewhat compressed, 1—2 feet high; *leaves* narrow, attenuated above, half as long as the stem; *panicle* simple, long, appressed; *spikelets* linear, 4—6-flowered; *flowers* very slender, acute, indistinctly nerved. Inundated meadows. Jn.

36. POA.

Spikelets compressed, ovate, oblong or linear, many-flowered (3—20); glumes 2, shorter than the lower flowers; paleæ subequal, awnless, often with an arachnoid web at base, the lower one herbaceous, scarious on the margin; scales ovate, acute, smooth.

* Flowers webbed at base.

1. P. PRATE'NSIS. *L. Spear Grass.* P. viridis. *Muh.*
Stem terete, smooth, 1—2 feet high; *leaves* carinate, linear, abruptly acute,

radical ones very long and numerous, cauline shorter than the nerved, smooth sheaths; *stipules* short, truncate: *panicle* diffuse, branches 3—5 together in half-whorls; *spikelets* ovate, acute, with about 4, acute flowers; *glumes* lanceolate, sharply acuminate. An excellent grass both for hay and pasturage, very abundant. May. Jn. Varies much in luxuriance according to the soil.

2. P. TRIVIA'LIS. *Roughish Meadow Grass.*

Stems sometimes stoloniferous at base, roughish backwards, 2—3 feet high; *leaves* lance-linear, acute, rough-edged, *lower ones* very long, *cauline* as long as the roughish sheaths, with long, acuminate stipules; *panicle* diffuse, expanding, scabrous, branches 4—5 together in half-whorls; *spikelets* oblong-ovate, 2—4 flowered. A grass equally common and valuable with the last. June. July.

3. P. COMPRE'SSA. *Blue Grass.*

Stem decumbent and rooting at base, much compressed, smooth, striate, 12—18 inches high; *leaves* linear, carinate, nerved, smooth, short, bluish green; *sheaths* smooth, rather loose, with a short, obtuse stipule; *panicle* contracted, somewhat secund, branches scabrous, in 2s and 3s; *spikelets* ovate-oblong, 3—6-flowered, subsessile. Less abundant than the last, forming tufts in moist places. June.

4. P. SEROTI'NA. *Ehr. Meadow Red-top.* P. palustris. *Muh.*

Stem erect, 2—3 feet high; *leaves* flat, narrow-linear, smooth, 10—15 inches long, *stipule* long, lacerated; *panicle* diffuse, somewhat secund, 6—10 inches long, branches in half-whorls: *spikelets* ovate-lanceolate, 2—3-flowered; *flowers* but little webbed at base, yellow at the tip, obscurely 5-nerved. Common in wet meadows. Jn.

5. P. NEMORA'LIS. *Wood Spear Grass.*

Stem slender, 2—3 feet high; *leaves* narrow-linear, pale green, smooth as well as the sheaths; *stipules* scarcely any; *panicle* 6—10 inches long, slender, nodding when in fruit, branches capillary, flexuous, in 2s or 3s; *spikelets* ovate, about 3-flowered, the flowers spreading and at length remote, slightly webbed at base. A tall, rank grass, in wet, open woods. July.

* * Flowers free, or not webbed at base.

6. P. A'NNUA. *Annual Spear Grass.*

Stems decumbent and rooting at the base, smooth, compressed, 3—8 inches long; *leaves* lance-linear, short, smooth, carinate, on loose, glabrous sheaths; *stipule* oblong, dentate; *panicle* spreading, the branches generally solitary, at length horizontal; *spikelets* ovate-oblong, rather numerous, containing about 5, loose flowers. A small, abundant, annual grass, forming a dense, soft and beautiful turf. May—Sept.

7. P. NERVA'TA. *Foul Meadow.*

Stem smooth, 3—4 feet high; *leaves* lance linear, striate, rough above, about a foot long, on striate, roughish sheaths; *stipule* lacerate; *panicle* large, loose, diffuse, equal, branches weak, pendulous in fruit, long and capillary, in 2s or 3s; *spikelets* ovate-oblong, containing about 5, obtuse, conspicuously 7-nerved flowers. A beautiful and valuable grass in wet meadows. Jn.

8. P. ELONGA'TA. *Torr.*

Stem round, erect, smooth, 3 feet high; *leaves* narrow-linear, smooth, 8—15 inches long; *sheaths* striate, smooth; *stipule* very short; *panicle* (8—10 inches) elongated, racemose, nodding, branches solitary or in 2s, appressed; *spikelets* ovate-obtuse, tumid, containing about 3, obtuse, 5-nerved flowers. Wet meadows. July.

9. P. OBTU'SA.

Stem smooth, firm, 2—3 feet high; *leaves* dark green, linear, often surpassing the stem, and with the sheaths smooth; *panicle* dense, ovate, many-flowered, 3—4 inches long; *spikelets* ovate, tumid, thick, containing 5—7, smooth, ovate, obtuse flowers; *lower palea* 7-nerved. Swamps. Aug. Sept.

10. P. CANADE'NSIS. Briza Canadensis. *Mx.*

Stem round, smooth, erect, 3—4 feet high; *leaves* broad-linear, rough, glaucous, on smooth sheaths; *stipule* lacerate, ovate-obtuse; *panicle* large, 6—8 inches long, branches flexuous, in half-whorls, much spreading or pendulous in fruit; *spikelets* short, ovate, tumid, 6—8-flowered; *glumes* much shorter than the lower flowers; *upper palea* very obtuse, *lower* about 7-nerved; *stamens* 2. A large and beautiful grass, in shady grounds. Jl. Aug.

11. P. CAPILLA'RIS.

Stem much branched at base, smooth, a foot high: *leaves* linear, attenuated above, flat, smooth; *sheaths* striate, with long hairs about the throat and margin; *stipule* short; *panicle* very large (near a foot long), with diffusely spreading, capillary branches, axils smooth; *spikelets* ovate, acute, about 3-flowered, on long pedicels; *paleæ* scabrous. Dry grounds. Aug. Ann.

12. P. HIRSU'TA. *Mx.*

Stem subsimple, compressed, erect, 1—2 feet high; *leaves* lance-linear, attenuate at end, surpassing the stem, hairy at base; *sheaths* loose, longer than the internodes, lower ones hairy, upper ones smooth; *stipule* fringed; *panicle* very large, capillary, branches spreading, reflexed in fruit, hirsute in the axils; *spikelets* oblong, about 5-flowered; *paleæ* ciliate Sandy fields. Jl. Aug.

β. spectabilis (*Torr.* P. spectabilis. *P.*); *spikelets* linear, 10—15-flowered; *stem* taller.

13. P. MARI'TIMA.

Stem somewhat geniculate, round, about a foot high; *leaves* somewhat glaucous, rough-edged, involute; *panicle* erect, dense, branches in pairs, scabrous; *spikelets* terete, linear, purplish, about 5-flowered; *flowers* obtuse, indistinctly 5-nerved. Salt marshes. Ms. *Bic.* Jn.

14. P. AQUA'TICA. *Torr.*

Smooth; *stem* stout, leafy, 4—5 feet high; *leaves* broad-linear, flat, thin; *panicle* erect, diffuse, branches at length spreading, flexuous, 3—5 together, in half whorls; *spikelets* linear, purple, with 6—8 ovate-obtuse flowers. Wet meadows. Aug.

15. P. DENTA'TA. *Torr.*

Smooth; *stem* erect, round, 3 feet high; *leaves* flat, linear, 10—16 inches long, glaucous beneath; *stipule* elongated; *panicle* large, loose, few-flowered, branches capillary, spreading; *spikelets* lanceolate, about 5-flowered; *lower glume* 3-nerved; *lower palea* 5-nerved, 5 toothed at the apex when old. Swamps. June. July.

16. P. FASCICULA'TA. *Torr.*

Very smooth; *stem* firm and leafy, oblique, round, branched at base, 1—2 feet high; *leaves* flat, lance-linear; *panicle* spreading, *branches* fasciculate, crowded, straight; *spikelets* oblong, somewhat racemed, sessile, crowded, about 3-flowered; *glumes* minute, unequal. Salt marshes. N. Y.

17. P. PECTINA'CEA. *Mx.* P. pilosa. *Muh.*

Stem cæspitose, oblique, geniculate at base, 8—12 inches high; *leaves* flat, smooth, pilose at base, 5-nerved, 2—4 inches long; *sheaths* bearded at the throat; *panicle* large, loose, capillary, purplish, hairy in the axils, branches subverticillate; *spikelets* linear, with 5—9 acute flowers; *upper palea* persistent on the rachis which thus is made finally to appear pectinate. In sandy fields. July. Aug.

18. P. REPTANS.

Diœcious; *stem* branched, creeping, rooting at the joints, 6—12 inches long; *leaves* subulate, flat; *sheaths* open, pilose on the margin and throat; *panicle* 1—2 inches long, branches short, simple, in fascicles, few-flowered: *spikelets* linear-lanceolate, with 12—20 acuminate flowers. Swamps. Jl. Aug.

19. P. ERAGRO'STIS. *Quake Grass.*

Stem oblique or decumbent, geniculate, 1—2 feet long; *leaves* lanceolate, attenuate at end, scabrous on the margin and above; *sheaths* pilose at the throat; *stipule* short, bearded; *panicle* expanding, branches subdivided, flexuous, subpilose in the axils; *spikelets* ovate-oblong, 12—20-flowered; *glumes* nearly equal. A beautiful grass, introduced into fields and roadsides. Aug.

37. BRIZA.

Spikelets cordate ovate, 6—9-flowered; glumes 2, shorter than the lower flowers; paleæ ventricose, lower one cordate at base, embracing the upper which is suborbicular and much shorter; caryopsis beaked.

B. ME'DIA.

Stem naked above, 1—2 feet high; *leaves* flat, smooth, lance-linear; *stipules* short, obtuse; *panicle* erect, few-flowered, branches wide-spreading, capillary, purplish, bearing the ovate or cordate, tumid, pendant and tremulous spikelets at the ends, these are about 7-flowered, greenish purple; *paleæ* nerveless. Naturalized in the vicinity of Boston. *Bw.* May.

38. UNI'OLA.

Spikelets compressed, 3—20-flowered; lower flower abortive; glumes 2, shorter than the lower flower; lower paleæ boat-shaped at the end, truncate and mucronate between the lobes, upper subulate, somewhat bifid; scales emarginate; caryopsis with 2 horns.

1. U. SPICA'TA.

Stem smooth, round, branched at base, 1—2 feet high; *cauline leaves* numerous, 3—6 inches long, involute, rigid and acute; *sheaths* longer than the joints, close, upper ones hairy at throat; *stipule* inconspicuous; *panicle* densely spicate, consisting of short, fasciculate branches with sessile spikelets; *spikelets* oblong, 5—9-flowered; *flowers* triandrous. Salt marshes. July.

2. U. GRA'CILIS. *Mx.*

Stem slender, leafy, 3—4 feet high; *leaves* broad-linear, tapering to a slender point, flat, 12—18 inches long; *sheaths* shorter than the joints; *panicle* long, racemose, branches solitary, short, remote, erect; *spikelets* 3-flowered; *flowers* spreading, straight, monandrous; *glumes* rigid, acute. Sea coasts. N. Y. Aug.

39. DA'CTYLIS.

Spikelets aggregated, compressed, 3—5-flowered; glumes unequal, the larger one carinate, shorter than the flowers; paleæ subequal, lanceolate, acuminate, the lower one emarginate, carinate, mucronate, upper bifid at apex; scales dentate.

D. GLOMERA'TA. *Orchard Grass.*

Stem roughish, 2—4 feet high; *leaves* linear-lanceolate, carinate, a little scabrous, glaucous; *sheaths* striate; *stipule* lacerate; *panicle* remotely branched, rather secund; *spikelets* about 4-flowered, in dense, glomerate, unilateral, terminal clusters; *glumes* very unequal; *anthers* large, yellow. A fine, well known grass, of rapid growth, introduced in shady fields, as orchards, &c. June.

TRIBE 8. CHLORIDEÆ.

Inflorescence spiked. Spikelets solitary, few-flowered, the terminal flower often abortive. Glumes carinate, not opposite. Upper palea with two keels.

40. ELEUSI'NE.

Spikes digitate, unilateral; spikelets 5—7-flowered; glumes obtuse, unequal, lower one smaller; paleæ unequal, upper one bifid toothed; scales truncate, imbricate; caryopsis triangular, ovate, enclosed in a separate membrane or perigynium.

E. I'NDICA. *Wire Grass.*

Stem oblique, compressed, procumbent and branching at base, 12—16 inches long; *leaves* linear, somewhat hairy, on smooth, loose sheaths hairy at the throat; *spikes* 2—4, rarely more or less, linear, straight; *spikelets* closely imbricate, smooth; *upper glume* 5-nerved; *fruit* dark brown. Common about houses, foot-paths, &c. Aug.

TRIBE 9. TRITICEÆ.

Inflorescence spiked. Spikelets solitary, in pairs, or several together, one, few or many-flowered. Glumes mostly two, equal and opposite, rarely unequal and alternate. Lower palea awned or awnless, upper one with two keels.

41. TRI'TICUM.

Spikelets imbricated in 2 rows, sessile on the teeth of the rachis, about 5-flowered, with the upper flowers abortive; glumes 2, equal, opposite, ovate, concave, mucronate; paleæ 2, lower awned or mucronate; scales 2, collateral.

1. T. SATI'VUM. β. hybernum. *L.* *Winter Wheat.*

Stem round, smooth, the internodes somewhat inflated, 3—5 feet high; *leaves* lance-linear, nerved, roughish above; *stipule* truncate; *spike* parallel, somewhat 4-sided; *spikelets* crowded, broad-ovate, about 4-flowered; *glumes* ventricose; *awns of the upper palea* generally longer than the flowers. This is without doubt the most valuable plant of the order; is universally cultivated and may be regarded as naturalized. Biennial. Many varieties are known to farmers, of which the most important are

β. *æstivum; glumes* always awned. Annual. *Summer Wheat.*
γ. *compositum; spike* compound; *spikelets* awned. *Egyptian Wheat.*

2. T. REPENS.

Stem trailing at the lower joints, about 2 feet long; *leaves* lance-linear, rough above and somewhat hairy; *stipule* short, truncate; *spike* compressed; *spikelets* remote, alternate, lance-oblong, 5—6-flowered; *glumes* lanceolate, 5-nerved, acuminate. A vile weed, in fields and gardens, extremely difficult to eradicate. June—Aug.

42. SECA'LE.

Spikelets solitary on the teeth of the rachis, 2—3-flowered, the two lower flowers fertile, sessile, opposite, the upper one abortive; glumes subulate, opposite, shorter than the flowers; lower palea with a very long awn, upper often bifid at apex; scales abortive, hairy.

S. CEREA'LE. *Rye.*

Stem hairy beneath the spike, 4—6 feet high; *leaves* lance-linear, rough-edged and rough above, glaucous; *spike* about 5 inches long, linear, compressed; *paleæ* smooth, lower ciliate on the keel and margin; *awns* scabrous-

ciliate, long, straight, erect. The native country of this highly valuable grain is unknown. It has long been cultivated, and like the wheat, may be considered naturalized. June. July.

43. HO'RDEUM.

Spikelets 3 at each joint of the rachis, 1-flowered, the lateral ones sometimes abortive; glumes 2, subulate, nearly equal, awned; paleæ 2, lower lance-ovate, long-awned, upper obtusely acuminate; caryopsis adhering to the paleæ.

1. H. VULGA'RE. *Barley.*

Stem smooth, 2—3 feet high; *leaves* lance-linear, carinate, nearly smooth; *sheaths* auriculate at the throat; *spike* thick, about 3 inches long; *spikelets* all fertile, 1-flowered, with an awn-like rudiment at the base of the upper palea; *glumes* collateral, shorter than the flowers; *fruit* arranged in 4 rows. Extensively cultivated. May.

2. H. DI'STICHUM. *Two-rowed Barley.*

Stem 2—3 feet high; *leaves* lance-linear, scabrous above; *sheaths* auriculate at the throat; *spike* 3—4 inches long, linear, compressed; *lateral spikelets* abortive, awnless; *fruit* arranged in 2 rows. More common, and is generally preferred for malting to the former species. June.

3. H. JUBA'TUM. *Squirrel-tail Grass.*

Stem slender, round, smooth, simple, about 2 feet high; *leaves* broad-linear, 4—6 inches long, rough-edged, otherwise smooth as well as the sheaths; *spikes* 2—3 inches long; *spikelets* with the lateral flowers neuter; *glumes* and *paleæ* produced into fine, smooth awns 6 times as long as the flowers; *abortive flowers* on short pedicels. Marshes. N. England. June.

44. LO'LIUM.

Spikelets many-flowered, sessile, remote, with the edge to the rachis; glume to the lower spikelet single, to the terminal one 2; paleæ herbaceous, subequal, lower one short-awned or mucronate, upper bifid-toothed.

1. L. PERE'NNE. *Darnel Grass.*

Smooth; *stem* terete, 1—2 feet high; *leaves* lance-linear, shining-green, on striate sheaths with truncate stipules; *rachis* flexuous, grooved, 5—6 inches long; *spikelets* about 16, longer than the glumes, 7—9-flowered, alternate, in two opposite rows; *lower palea* 5-nerved, *upper* with 2 prominent, rough keels. Naturalized in meadows, cultivated grounds, &c. May—June.

2. L. TEMULE'NTUM. *Poisonous Darnel.*

Stem terete, smooth, 2 feet high; *leaves* lance-linear, rough-edged, and with the sheaths smooth on the surface; *stipule* truncate; *rachis* flexuous, 4—6 inches long; *spikelets* much compressed, 5—7-flowered, longer than the glumes; *lower palea* 5-nerved, produced into an awn twice its length. Remarkably distinguished from all other grasses by its poisonous seeds. July. Ann. It is said by Muhlenberg to be naturalized in New England.

45. E'LYMUS.

Spikelets 2 or more at each joint of the rachis, 2—6-flowered; glumes 2, collateral, subequal, subulate; paleæ lanceolate, lower one entire, mucronate or awned; scales ciliate.

1. E. VIRGI'NICUS. *Lime Grass.*

Stem erect, smooth, 3—4 feet high; *leaves* lance-linear, flat, scabrous, deep green, ½ inch broad; *sheaths* nerved; *stipule* very short; *spike* erect, thick, 3—5 inches long; *spikelets* in pairs, about 3-flowered; *glumes* both in front, lance-linear, slightly connate at base, produced into a scabrous awn; *flowers* smooth; *lower palea* awned. Banks of streams. July. Aug.

2. E. CANADE'NSIS. E. glaucifolius. *P.*

Stem erect, smooth, stout, 3—5 feet high; *leaves* lance-linear, flat, smooth, dark green or often glaucous; *spike* rather spreading, 4—8 inches long, generally nodding at the summit; *rachis* hairy; *spikelets* 2—5-flowered; *glumes* 5—7-nerved, short-awned, hairy; *lower palea* hairy, awned. A tall, beautiful grass, with long, recurved, waving spikes. River banks, &c. Aug.

3. E. VILLO'SUS. *Rye Grass.*

Stem slender, striate, smooth, 2—3 feet high; *leaves* rough-edged, pubescent above, ½ inch broad; *sheaths* hairy, especially the lower ones; *spike* 2½—3½ inches long, a little nodding and spreading; *rachis* and *flowers* hispid, pilose; *spikelets* 1—3-flowered; *glumes* linear; *lower palea* with a long, straight awn. Dry grounds. July.

4. E. HYSTRIX. *Hedgehog Grass.*

Stem round, smooth, 2—4 feet high; *leaves* lance-linear, carinate, scabrous, generally glaucous and with the sheaths striate; *spike* 4—6 inches long, erect; *rachis* nearly smooth, flexuous; *spikelets* remote, diverging, almost horizontal, 2—3-flowered; *glumes* 0, rarely 1 or 2; *flowers* smoothish; *lower palea* terminating in a very long awn. An odd looking grass, common in moist woods. July.

TRIBE 10. SACCHARINEÆ.

Inflorescence panicled or spiked. Spikelets generally in pairs, one sessile and perfect, the other mostly pedicellate and imperfect. Glumes of stouter texture than the paleæ. Paleæ delicate and membranaceous, the lower commonly awned.

46. ANDROPO'GON.

Spikelets in pairs, polygamous, the lower one incomplete, on a plumosely bearded pedicel, upper one 1-flowered, perfect; glumes subcoriaceous, awnless; paleæ shorter than the glumes, one generally awned.

1. A. FURCA'TUS. *Muh. Forked Spike.*

Stem semiterete above, 3—5 feet high; *leaves* lance-linear, rough-edged, radical ones very long; *spikes* digitate or fasciculate, in 2s—5s, 3—5 inches long, purple; *spikelets* appressed, abortive one on a plumose pedicel, staminate, with 2 paleæ, awnless, perfect one with 2 unequal glumes; *lower palea* bifid, awned between the divisions. Meadows and low grounds. Aug.

2. A. SCOPA'RIUS. *Mx. Purple Brown Grass.*

Stem slender, paniculate, 3 feet high, branched, one side furrowed, branches fasciculate, erect; *leaves* lance-linear, somewhat hairy and glaucous; *spikes* simple, lateral and terminal, on long peduncles, 2—3 from each sheath, purple; *spikelets* remote, abortive one neuter, mostly with 2 paleæ, awned. Woods. Aug.

3. A. VIRGI'NICUS.

Cæspitose; *stem* subcompressed, 3 feet high, branches few and short, half concealed; *leaves* linear, lower ones a foot or more long, rough-edged and hairy; *sheaths* smooth; *spikes* short, in slender, half concealed fascicles of 2 or 3, lateral and terminal; *abortive spikelet* a mere pedicel, without paleæ, *perfect* monandrous, with a straight awn. Swamps. Sept.

4. A. MACROU'RUS. *Indian Grass.*

Stem sulcate on one side, much branched above, 2—3 feet high; *leaves* linear, rough, lower ones very long, upper ones erect; *sheaths* hairy; *spikes* conjugate, ½—1 inch long, in dense lateral and terminal, fastigiate panicles, partly concealed; *abortive spikelet* without paleæ; *perfect flower* monandrous, with a straight awn. Swamps. Sept.

5. A. NUTANS. *Beard Grass.*

Glabrous; *stem* terete, simple, 3—5 feet high; *leaves* glaucous, lance-linear, rough, ½ inch broad; *panicle* oblong, branched, nodding, 6—10 inches long; *abortive spikelet* without paleæ; *glumes of the perfect flower* hairy, ferruginous, shining; *awn* contorted. Sandy fields. Oct.

47. SORGHUM.

Spikelets in 2s or 3s, abortive ones pedicellate, awnless, with 2 paleæ, perfect, sessile, 1-flowered; glumes 2, coriaceous; paleæ 3, the upper one awned.

1. S. SACCHARA'TUM. *Stem* thick, solid with pith, 6—10 feet high; *leaves* lanceolate, acuminate, pubescent at base; *panicle* large, diffuse, with long, verticillate, at length nodding branches; *glumes of the perfect spikelet* hairy, persistent. From the E Indies. The uses of this fine, cultivated plant are doubtless well known to our readers. *Broom Corn.*

2. S. VULGA'RE. *Stem* erect, round, solid with pith, 6—10 feet high; *leaves* carinate, lanceolate; *panicle* compact, oval erect until mature; *flowers* pubescent; *palea* caducous; *fruit* naked. From the E. Indies. Rarely cultivated as a curiosity, or for the seed as food for poultry. *Indian Millet.*

TRIBE 11. OLYREÆ.

Inflorescence panicled or spiked. Spikelets solitary, 1—3-flowered. Flowers perfect or diclinous. Stamens 1—6.

48. LEE'RSIA.

Spikelets 1-flowered, compressed; glumes 0; paleæ 2, compressed, carinate, awnless; scales 2, membranaceous.

1. L. ORYZOI'DES. *Cut Grass.*

Stem retrorsely scabrous, 3—5 feet high; *leaves* lanceolate, carinate, the margin very rough backwards; *sheaths* also very rough with retrorse prickles; *panicle* much branched, diffuse, sheathed at the base; *spikelets* spreading; *paleæ* ciliate on the keel, white, compressed and closed; *stamens* 3. A very rough grass, common in swamps, by streams, &c. Aug.

2. L. VIRGI'NICA. *White Grass.*

Stem slender, branched, geniculate or decumbent at base, 2—3 feet long, nodes retrorsely hairy; *leaves* lance-linear, roughish; *sheaths* roughish backwards, striate; *panicle* simple, at length much exserted, the lower branches diffuse; *flowers* pedicellate, in short, appressed, flexuous racemes; *lower palea* boat shaped, mucronate; *stamens* 1—2. Damp woods. Aug.

49. ZIZA'NIA.

Monœcious; glumes 0; spikelets 1-flowered; paleæ 2, herbaceous. *Sterile.*—Paleæ subequal, awnless; stamens 6. *Fertile.*—Spikelets subulate; paleæ unequal, linear, lower one with a straight awn; styles 2; caryopsis enveloped in the plicate paleæ.

Z. AQUA'TICA. *Indian Rice.*

Stem ½ inch in diameter, fistular, smooth, 6 feet high; *leaves* lance-linear, 2—3 feet long, an inch wide, smooth, serrulate; *panicle* a foot or more long, pyramidal, the lower branches divaricate and sterile, the upper spicate and fertile; *spikelets* on clavate pedicels; *awns* long, hispid; *fruit* slender, ¾ inch long, blackish, deciduous, farinaceous. Inundated shores of ponds and rivers. The fruit, which is very abundant, affords sustenance to wild geese, ducks, and other water fowls. Aug.

50. TRIPSA'CUM.

Monœcious; spikes digitate; glumes 2, coriaceous; paleæ 2, membranaceous. *Sterile spikelets* 2-flowered, outer flower staminate, inner neuter. *Fertile spikelets* 3-flowered, the 2 lateral flowers abortive; outer glume enclosing the flowers in a cavity of the rachis, with an aperture each side at base.

T. DACTYLOI'DES. *Sesame Grass.*

Stem slightly compressed, smooth, solid with pith, brown at the nodes, 4—6 feet high; *leaves* near an inch broad, long, lance-linear, smooth beneath, roughish above; *spikes* 5—8 inches long, usually 2—3 together, digitate, terminal, staminate flowers above, pistillate below, without awns. River banks and sea shores. Rare. July.

β. monostachyon; spike single.

51. ZEA.

Monœcious. *Staminate fls.* in terminal, paniculate racemes; spikelets 2-flowered; glumes 2, herbaceous, obtuse, subequal; paleæ membranaceous, awnless, obtuse. *Pistillate fls.* lateral, axillary, on a spadix enclosed in a spathe of numerous bracts; spikelets 2-flowered, one flower abortive; glumes 2, very obtuse; paleæ awnless; style 1, filiform, very long, pendulous; caryopsis compressed.

Z. MAYS. *Maize. Indian Corn.*

Root fibrous, annual; *stem* erect, 5—10 (in some varieties 15—20) feet high, channeled on one side, leafy; *leaves* lance-linear, entire, 2—3 feet long. The varieties of this noble plant are numerous, produced by climate and culture. It is a native of the warm latitudes of America, but how widely it has been cultivated on both continents, and how important it is to man, it is unnecessary here to state. July.

SECOND GRAND DIVISION,

CRYPTOGAMIA, OR FLOWERLESS PLANTS.

Plants chiefly composed of cellular tissue, without spiral vessels, destitute of true flowers, and producing SPORES *instead of seeds.*

CLASS V. ACROGENS.

Flowerless plants with a proper STEM or AXIS, often with a vascular system composed chiefly of annular ducts, usually furnished with leaves. GROWTH by the extension of the apex, without subsequent increase in diameter. SPORES with a proper integument, and contained in a vessel analagous to an ovary, called THECA or SPORANGIUM.

ORDER CLXII. EQUISETACEÆ. *The Scouring Rush Tribe.*

Inflorescence (by analogy) a dense, cylindric, terminal spike or strobile.
Scales of the strobile peltate, hexagonal, subverticillate.
Thecæ 4—7, attached to the under surface of the scales, with lateral dehiscence.
Spores numerous, globose, surrounded by minute granules. [in a spiral manner.
Elaters, bodies of unknown use, consisting of 4 elastic, clavate filaments involving the spores
Plant leafless, simple or with verticillate branches.
Stem striate-sulcate, jointed, fistular between, and separable at, the joints.
Sheaths dentate, crowning the summit of each internode.

An order consisting at present of a single genus, growing in wet grounds, on river banks, and borders of woods, throughout most countries. The Equisetaceæ abound in the fossil remains of coal measures with other Cryptogamia, as Lycopodiaceæ and Filices, indicating that these plants were once of gigantic dimensions, and formed a large part of the original flora of our globe.

Properties. They abound in silex, and hence are used by cabinet-makers, comb-makers, &c., in polishing their work.

EQUISE'TUM.

Character the same as that of the order.

1. E. HYEM'ALE. *Scouring Rush.*

Stems all simple, erect, very rough, each bearing a terminal, ovoid spike; *sheath* cinerous white, black at the base and summit, short, with subulate, awned and deciduous teeth. Very noticeable in wet, shady grounds, and by brook sides. Stems about 2 feet high, often 2 or more united at base from the same root. Sheaths 1—2 lines long, 1—2½ inches apart, the white ring much broader than the black, at length entire from the falling of the teeth. The roughness of the cuticle is owing to the silex in its composition. Jn.

2 E. ARVE'NSE. *Field Horsetail.*

Fertile stems erect, simple, *sterile* with simple, quadrangular branches, decumbent at base. Low grounds. Fertile stems first appearing. 6—8 inches high, with 3—5 joints surmounted by large, inflated sheaths cut into long, dark brown teeth. Spike oblong. ½—2 inches long. Sterile stems rather taller than the fertile, remaining through the season, after these have decayed. At each joint is a whorl of simple, rough, ascending branches, issuing from the base of the sheaths, their joints also sheathed. April.

3. E. SYLVA'TICUM. *Wood Horsetail.*

Sterile and *fertile stems* with compound, rough, deflexed, angular branches. Grows in woods and low grounds. Stems 9—16 inches high; the fertile with 4—5 whorls of branches from the base of the sheaths which are 2—3 inches apart, and cleft into several large, tawny red teeth or segments; the sterile taller and more slender, with more numerous whorls of branches. The branches are all subdivided and curved downwards. Spike oval cylindric, pedicellate. May.

4. E. VARIEGA'TUM. *Sw.* E. scorpoides. *Mx.*

Cæspitose; *stems* branching at base, filiform, scabrous; *spike* blackish; *sheaths* 3-toothed, blackish, teeth membranaceous, whitish, deciduous at the tips. Hilly woods. Stems numerous, 3—6 inches long, 6-furrowed (5-furrowed. *Beck*). sheaths very short, 1—2 inches apart. Spikes small, ovoid terminal. July.

5. E. LIMO'SUM. *L. Pipes.* E. nliginosum. *Willd.*

Stems somewhat branched, erect, striate-sulcate; *branches* from the middle joints, simple, short, 5-sided, smooth; *spike* oblong-ovoid; *sheaths* appressed. Borders of ponds and swamps Stems 2—3 feet high, slender, rarely simple, generally with 2—6 whorls about the middle. Branches very irregular in length and position. Sheaths 3—4 lines long, white at the summit, tipped with as many black, subulate teeth as there are furrows (15—20). This species is greedily devoured by cattle. July.

6. E. PALU'STRE. *Marsh Horsetail.*

Stems branched, smooth, sulcate; *branches* simple, pentagonal, curved upwards; *sheath* somewhat appressed, remote. 10-toothed at the apex; *spike* oblong, dark brown. Marshes. Stems 1—2 feet high, deeply furrowed. Branches short and like the other species produced in whorls from the bases of the sheaths, at first horizontal, finally bending to an upright position. Spike an inch long. May. June.

ORDER CLXIII. LYCOPODIACEÆ. *The Club Moss Tribe.*

Inflorescence axillary, or crowded into a sort of ament or spike.
Theceæ of two kinds in the same plant, sessile, 1, often 2-celled.
Spores few, rather large in some of the theceæ, other theceæ containing minute grains, appearing like fine powder.
Stems creeping or erect, branching, rarely simple, abounding in ducts.
Leaves small, numerous, crowded, entire, lanceolate or subulate, 1-nerved.

Like the Equisetaceæ, these plants appear to have been very abundant in the first ages of the world, and to have attained a gigantic size, though at present but a few feet in length. Properties unimportant. Some are emetic The powder contained in the theceæ is highly inflamable, and is used in the manufacture of fireworks.

Genera.

Leaves cauline, on erect or creeping stems.	*Lycopodium.*	1
Leaves or fronds radical, long, linear-subulate.	*Isoetis.*	2

1. LYCOPO'DIUM.

Thecæ axillary, sessile, 1-celled, some of them 2-valved, filled with minute, farinaceous grains, others 3-valved, containing several larger globular spores.

* Inflorescence in pedunculate spikes.

1. L. CLAVA'TUM. *L. Common Club Rush.* L. tristachium. *Nutt.*

Stem creeping; *branches* ascending; *leaves* scattered, incurved, capillaceous-acuminate; *spikes* in pairs, rarely in 3s, cylindrical, pedunculate; *bracts* of the spike ovate, acuminate, erosely denticulate. A well known evergreen, trailing upon the ground in shady pastures and woods. Stem and branches clothed with numerous, linear-lanceolate leaves which are entire or serrulate, and end in a pellucid, curved bristle. Spikes perfectly straight, parallel, erect, and upon an erect peduncle. July.

2. L. COMPLANA'TUM. *Ground Pine.*

Stem trailing; *branches* dichotomous; *leaves* 4-ranked, unequal, the marginal ones connate, diverging at apex, the superficial ones solitary, appressed; *peduncles* elongated, supporting 4—6, cylindric spikes. A trailing evergreen, common in woods and shady grounds. Stem round, creeping among the moss and leaves, often 10 feet in length. Branches numerously subdivided, compressed, somewhat resembling the branchlets of the cedar. Leaves minute, very acute. July.

3. L. CAROLINIA'NUM.

Stem creeping; *leaves* somewhat 2-ranked, spreading, lanceolate, entire; *peduncle* erect, solitary, elongated, bearing a single spike; *bracts* sublanceolate, entire. In muddy grounds. Both the stem and its branches are prostrate with erect, slender peduncles 3—4 inches high. July.

4. L. SABINÆFO'LIUM. *Willd.* L. alpinum. *Mx.*

Stem elongated, creeping; *branches* erect, short, dichotomous, with fastigiate divisions; *leaves* imbricated on all sides, erect, terete-subulate, aristate-acuminate; *spikes* peduncled by the attenuated and slightly leafy summits of the branches, cylindric, solitary, with cordate, acuminate bracts. White Mts.; extensively creeping among the rocks, with erect, numerously divided branches, a few of the divisions terminating in spikes an inch in length. Jl.

* * Spikes sessile. † Leaves surrounding the stem.

5. L. DENDROI'DEUM. *Tree Club Moss.*

Stem erect; *branches* alternate, crowded, dichotomous, erect; *leaves* linear-lanceolate, in 6 equal rows, spreading; *spikes* numerous, solitary. An elegant little plant, common in woods, readily distinguished by its upright, tree-like form. Plant about 8 inches high, with branches more or less diverging. These are subdivided into numerous, forked branchlets, radiant, so as together to represent a spiral arrangement. Spikes 1—4, an inch long. July.

β. *obscurum* (*Torr.* L. obscurum. *L.*); *branches* spreading; *spike* mostly solitary.

6. L. RUPE'STRE. *Rock Club Moss.*

Stem creeping; *branches* ascending, subdivided; *leaves* scattered, imbricate, linear-lanceolate, capillaceous-acuminate, ciliate; *spike* solitary, quadrangular. A very small species, creeping on rocks, &c. Stem a few inches in length, with numerous branches which are ½—1 inch long, clothed with grayish green leaves. Spike ½ inch long, 4-rowed, seeming a mere continuation of the branch. July.

7. L. ALOPECUROI'DES. *Fox-tail Club Moss.*

Stem creeping, subramose; *branches* simple, long, ascending, bearing a single sessile spike at top; *leaves* linear-subulate, ciliate-dentate at base, spreading; *spike* leafy. Swamps. Stem extensively creeping. Branches

6—8 inches high, rarely subdivided, densely clothed with a fine, soft foliage. Spike 1—2 inches long, very leafy. Aug.

8. L. ANNOTI'NUM. *Interrupted Club Moss.*
Stem creeping; *branches* twice dichotomous, ascending; *leaves* in 5 rows, linear-lanceolate, mucronate, spreading and serrulate near the tip; *spike* oblong, solitary. In mountain woods. Branches subdivided near their base, branchlets simple, 4 or more, 6—8 inches high. Leaves at length reflexed at end. Spike rather cylindric, an inch in length, distinct from the branches. Jl.

9. L. INUNDA'TUM. *Marsh Club Moss.*
Stem creeping, often submersed; *branches* simple, solitary, erect, with a single leafy spike at top; *leaves* linear, scattered, acute, entire, curved upwards. In swamps. Spikes ½—1 inch long, at the summit of branches 5—7 inches long, arising from the base of the stem. Bracts of the spikes leaf-like, dilated at base, spreading at the end, larger than the stem leaves which are 1—2 lines long. July.

10. L. SELAGINOI'DES. *Savin-leaved Club Moss.*
Stem filiform, creeping; *branches* nearly erect, the flowering ones simple; *leaves* scattered, lanceolate, a little spreading, ciliate-denticulate; *spike* solitary, leafy. In moist woods. Spikes yellowish green, about ¾ inch long, the bracts foliaceous and twice larger than the true leaves, which are about a line in length. Branches 3—6 inches high, the sterile ones much divided. July.

** Spikes sessile. †† Leaves 2-ranked.

11. L. A'PODUM. *L.* L. albidulum. *Muh.*
Stem branching, prostrate and rooting near the base; *leaves* orbicular-ovate, acute, membranaceous, alternate, amplexicaul, in 2 rows, with minute, acuminate, superficial ones in a third row on the upper side; *spikes* subsolitary. A small, creeping, moss-like species, in wet, rocky shades. Stem a few inches long, filiform. Leaves less than a line in length. Spikes leafy, scarcely distinguishable from the branches. July. Aug.

*** Spikes indistinguishable from the branches.

12. L. LUCI'DULUM. *Shining Club Moss.*
Stem ascending, dichotomously divided; *leaves* in 8 rows, linear-lanceolate, denticulate, shining, spreading or a little reflexed; *thecæ* in the axils of leaves not changed nor crowded into a spike. In wet woods. The foliage of this species is dark green and shining, more ample than is common to the genus. Stems 8—16 inches long, nearly erect. Leaves 3—5 lines long, distinctly serrate. Thecæ hemispherical or reniform, in the axils of the leaves near the top of the stem. July.

13. L. SELA'GO. *L. Fir Club Moss.* L. recurvum. *Willd.*
Stem erect, dichotomously and fastigiately branched; *leaves* scattered, imbricate, lance-linear, entire, rigid and pungent, but awnless. A smaller species than the last, found on the summits of the White Mts. Stems 4—8 inches high, densely clothed with stiff, shining, spreading leaves arranged somewhat in 8 rows and 2—3 lines in length. Thecæ axillary. Aug.

2. ISOE'TES.

Theca membranaceous, oblong, cordate, 1-celled, immersed in the dilated base of the frond; spores subglobose, slightly angular, attached to numerous filiform receptacles.

1. LACU'STRIS. *Quill-wort.*
Fronds cæspitose, subulate, semiterete, dilated and imbricated at base. A curious aquatic, in water at or near the margin of ponds and rivers. N.Y. N.H.

Leaves or fronds numerous, tufted and simple, 2—10 inches long, somewhat spreading, containing numerous cells divided both by longitudinal and transverse partitions. Thecæ whitish, imbedded in corresponding cavities in the bases of the fronds, traversed within by many threads to which the numerous, small, white granular spores are attached. Aug.

ORDER CLXIV. FILICES. *The Fern Tribe.*

Inflorescence occupying the back or margin of the fronds (leaves) arising from the veins.
Thecæ or *sporangia* of one kind only in the same plant, 1-celled, dehiscing irregularly.
Sori, somewhat regular collections of thecæ; or the thecæ are isolated and scattered.
Indusium, a scale investing each sorus; or the sori are covered with the revolute margin of the frond, or they are naked.
Stem a creeping, horizontal rhizoma, or sometimes erect and arborescent.
Fronds (frond-bearing leaves) variously divided, rarely entire, with forked-veins, mostly circinate in vernation.

A large and interesting order of perennial, flowerless plants, distinguished for their elegant, plume-like foliage. They are usually a few inches to a few feet high, but some of the tropical species, as the Cyatheæ of both Indies, are 15—25 feet high, vieing with the palms in size and beauty.

Properties. Generally mucilaginous and mildly astringent, hence considered pectoral. Aspidium and Pteris are anthelmintic. Osmunda regalis has been successfully administered for the rickets.

Observation. The fructification of the ferns, with its various appendages, is too minute to be well observed by the naked eye; but an examination of it with the aid of a good lens, cannot fail to be interesting and satisfactory.

Conspectus of the Genera.

* *Fertile leaflets or fronds contracted into the form of a panicle or spike.*

Fern erect.	Fronds many, radical,	the fertile ones distinct.	Stipes smoothish,	angular.	*Onoclea.* 9
				deeply grooved within.	*Struthiopteris.* 10
			Stipes clothed with reddish wool.		*Osmunda.* 11
		each one partly fertile.			*Osmunda.* 11
	Frond solitary, on a scape,		entire. Scape spicate.		*Ophioglossum.* 13
			divided. Scape paniculate.		*Botrychium.* 14
Fern climbing, stem long and slender.					*Lygodium.* 12

* * *Fronds sometimes contracted, but never paniculate or spicate.*

Frond pinnate, &c.	Sori round or roundish.	Indusium beneath the sori, fimbriate.	superficial,	single, large.	*Aspidium.* 2
				double (1 marginal).	*Dicksonia.* 8
					Woodsia. 4
		Indusium 0.			*Polypodium.* 1
	Sori linear or oblong, . .	not marginal, . . .	transverse, on the veins.		*Asplenium.* 3
			parallel with the midrib.		*Woodwardia.* 5
		closely marginal, continuous.			*Pteris.* 6
Frond pedate, on a black, polished, bifurcate stipe.					*Adiantum.* 7

TRIBE 1. POLYPODIACEÆ.

Thecæ furnished with a vertical, jointed, elastic and usually incomplete ring, and bursting transversely and irregularly.

1. POLYPO'DIUM.

Sori roundish, scattered on various parts of the under surface of the frond; indusium none.

1. P. VULGA'RE. *L. Common Polypod.* P. Virginianum. *Willd.*

Frond deeply pinnatifid, smooth; *segments* linear-oblong, obtuse, crenulate, the upper ones gradually smaller; *sori* large, distinct. Rather common on shady rocks and in woods, forming tangled patches with their roots which are clothed with membranous scales. Fronds nearly a foot high, divided into

alternate segments nearly to the midrib. Stipe naked and smooth. Segments parallel, a little curved, about $\frac{1}{4}$ inch wide. Fruit in large, golden dots in a double row, at length brownish. July.

2. P. PHLEGO'PTERIS. *L.* *Triangular Polypod.* P. connectile. *Mx.*

Frond bipinnatifid, slightly pubescent and ciliate, of a triangular outline, the 2 lower leaflets or pinnæ deflexed; subdivisions lanceolate, obtuse, the upper ones entire, lower incisely crenate, lowest adnate-decurrent; *sori* minute, distinct, solitary. A fern in low woodlands, remarkable for the broad triangular outline of its fronds. These are about a foot in hight, and rendered a little hastate by the lower leaflets (which are broadest) being deflexed. Divisions acuminate, connected at base by the lower segments. Stipes smooth. Aug.

β. connectile (P. connectile. *Mx.*); somewhat rigid; *segments of the lower divisions* all subentire; *veins* nearly simple.

γ. hexagonopterum (*P.* hexagonopterum. *Mx.*); texture more delicate; *segments of the lower divisions* pinnatifid; *veins* much forked.

3. P. DRYO'PTERIS. *Ternate Polypod.*

Frond ternate, bipinnate; *branches of the frond* spreading, deflexed, segments obtuse, subcrenate: *sori* marginal; *root* filiform, creeping. This beautiful fern grows in shady places and mountainous woods. Rare. Root black and very slender. Stipe slender and delicate, smooth, nearly a foot high, dividing into 3 light green, drooping, compound leaflets of very delicate texture. July.

β. calcareum (P. calcareum. *Sw.*); *branches of the frond* erect, rather rigid.

2. ASPIDIUM.

Sori roundish, or elliptical, scattered; indusium orbicular and umbilicate (fastened at the centre and opening all around), or reniform, fastened on one side and opening on the other.

* Frond pinnate.

1. A. ACROSTICHOI'DES.

Leaflets of the frond distinct, alternate, subsessile, falcate-lanceolate, auriculate on the upper side at base, ciliate-serrulate, only the upper ones fertile; *sori* at length confluent; *stipe* chaffy. Common in rocky shades. Frond 15—18 inches high, of a narrow-lanceolate outline. Stipe with loose, chaffy scales. Leaflets numerous, slightly curving upwards, 1—2 inches in length, the terminal ones which alone are fruitful, are contracted in size, the under side becoming overspread with the sori. June. Aug.

** Frond pinnate with pinnatifid leaflets.

2. A. THELY'PTERA. *Willd.* A. Noveboracense. *Willd.*

Leaflets of the frond linear-lanceolate, deeply pinnatifid, distinct, subsessile; *segments* oblong, obtuse or acute, subentire, ciliate; *sori* marginal, small, at length confluent; *stipe* smooth and naked. Damp woods. Fronds pale green, thin and delicate, about a foot long and $\frac{1}{3}$ as wide, acuminate at apex. Leaflets acuminate, becoming entire above, sometimes crossing (decussating) at base. Rachis pubescent. Stipe slender, channeled on the upper side. Sori in 2 marginal rows on each segment, finally nearly covering their under surface. July.

β. Noveboracense (A. Noveboracense. *Willd.*); rather paler and more delicate in texture; *leaflets* more narrow and remote.

3. A. CRISTA'TUM. *Willd. Crested Shield Fern.* Nephrodium. *Mx.*

Frond nearly bipinnate, lanceolate-ovate; *leaflets* subcordate, oblong-pinnatifid, segments oblong, obtuse, ciliate-serrate; *stipe* scaly. Moist woods and meadows. Frond 12—18 inches high, pale green, remarkable for its ovate-lanceolate outline. Segments of the leaflets sometimes almost distinct, broad and obtuse, with sharp teeth. Sori large, in double rows, tawny when mature, chiefly on the upper half of the frond. July.

β. Lancastriense (*Torr.* A. Lancastriense. *Muh.*); *frond* rather narrowly lanceolate; *leaflets* nearly opposite; *stipe* nearly naked; *sori* dark brown.

4. A. GOLDIA'NUM. *Hook. Goldie's Fern.* A. Filix mas. *P.*

Leaflets of the frond lanceolate, acuminate, deeply pinnatifid; *segments* oblong, subacute, subfalcate, mucronate-serrate; *sori* in 2 rows, each side of the nerve of each segment. A tall species 2—3 feet high, in rocky woods. Fronds numerous, bright green, scaly upon the stipe and rachis, 5—10 inches wide. Leaflets 3—6 inches long, not widening at base, with elongated, narrow segments. July.

* * * Frond bipinnate.

5. A. MARGINA'LE. *Sw. Marginal Shield-Fern.* Nephrodium. *Mx.*

Segments of the leaflets oblong, obtuse, decurrent, crenate-sinuate, repand at base, lower ones almost pinnatifid; *sori* marginal; *stipe* chaffy. A large, handsome fern in rocky woods. Frond 12—18 inches high, very smooth (rachis a little chaffy), its divisions nearly opposite. Segments of the leaflets distinct, near an inch long, $\frac{1}{4}$ as wide, contracted at base, then decurrent, forming a narrow margin along the rachis. Fruit in round dots, in regular rows along the margins of the segments. Indusium large, orbicular, with a lateral sinus. July.

6. A. TE'NUE. *Sw. Brittle Shield-Fern.* A. fragilis. *Willd.* Cistopteris. *Bernh.*

Segments of the leaflets oblong, obtuse or acute, incisely serrate, approaching to pinnatifid, its serratures subentire; *rachis* winged by the decurrent leaflets; *stipe* chaffy at base. A delicate fern, on moist rocks. Fronds 6—12 inches high, dark green, its divisions rather remote, and with the subdivisions, considerably variable in form. Sori large and numerous, near the margins of the segments. June. July.

7. A. ACULEA'TUM. *Sw. Prickly Shield-Fern.*

Segments of the leaflets ovate, subfalcate, acute, aculeate-serrate, upper ones truncate at base, lower cuneate at base; only the *upper leaflets* fertile; *stipe* and *rachis* chaffy. Mansfield Mt., Vt., and Mts. in Essex Co., N. Y. *Macrae.* Fronds dark green, in tufts 1—2 feet high. Segments of the leaflets on very short petioles, somewhat dilated at base on the upper side, deeply serrate, each serrature tipped with a short spinose bristle. Sori brown, in single rows, distinct. Indusium reniform. Aug.

8. A. DILATA'TUM. *Sw. Broad Shield-Fern.* A. spinulosum. *Willd.?*

Leaflets oblong-lanceolate, distinct; *segments* distinct, oblong, obtuse, incisely pinnatifid; *ultimate segments* mucronate-serrate; *stipe* chaffy; *indusium* umbilicate. Woods and shady pastures. Fronds 1—2 feet high, nearly tripinnate, the foliage about twice as long as wide, acuminate at apex, abrupt at base. Leaflets also acuminate, but the segments rather obtuse, all distinct at base, except those near the summit, serratures with short, soft bristles. Stipe with large, tawny scales. Sori rather large, somewhat in 2 rows. Jl.

9. A. BULBI'FERUM. *Sw. Bulbiferous Shield-Fern.* Cistopteris. *Bernh.*

Frond bipinnate, oblong-lanceolate, segments opposite, oblong, serrate, the lower one pinnatifid; *rachis* bulbiferous; *sori* roundish, the indusium attached

to one side. In damp woods. Frond 12—18 inches high, remarkable for the little bulbs produced in the axils of the rachis, which, falling to the ground, take root. Foliage narrow, tapering to an acuminate summit. Stipe smooth. July.

3. ASPLE'NIUM.

Sori linear, oblique, or somewhat transverse, scattered; indusium arising from the lateral veins and opening longitudinally, usually towards the midrib.

1. A. RHIZOPHY'LLUM. *Walking Fern.*

Frond mostly undivided, lanceolate, stipitate, subcrenate, cordate-auriculate at base, the apex attenuated into a long, slender acumination, rooting at the point. This singular fern grows in rocky woods, not very common. The frond is 4—8 inches long; the long, slender, linear point bending over backwards, reaches the earth and there strikes root, giving rise to a new plant. Though usually with slightly crenate margins, the plant varies by imperceptible degrees, becoming sometimes so deeply crenate as to form a variety with pinnatifid fronds. July.

2. A. EBE'NEUM. *Ebony Spleenwort.*

Frond pinnate; *leaflets* lanceolate, subfalcate, serrate, auriculate at base on the upper side; *stipe* smooth and polished. A beautiful fern, in dry woods, hills, &c. Fronds 8—14 inches high, on a slender stipe of a shining brown or black color. Foliage 5—9 inches long, 1—1½ inch wide, linear-lanceolate in outline. Leaflets near an inch in length, rather acuminate and curved at apex, dilated at base on the upper side, and sometimes on the lower. Fruit arranged in short lines on each side the midrib. July.

3. A. ANGUSTIFO'LIUM. *Mx.* *Swamp Spleenwort.*

Frond pinnate; *leaflets* alternate, upper ones subopposite, linear-lanceolate, serrate towards the apex, somewhat repand, the base truncate on the upper side and rounded on the lower. In low woods. Fronds 1—2 feet high, in tufts, the outer ones barren, inner fertile. Sori large, diverging from the midrib, parallel with the veins, at length confluent. July.

4. A. TRICHO'MANES. *L.* *Dwarf Spleenwort.* A. melanocaulon. *Muh.*

Frond pinnate; *leaflets* roundish, subsessile, small, roundish-obovate, obtusely cuneate and entire at base, crenate above; *stipe* black and polished. A small and delicate fern, forming tufts on shady rocks. Frond 3—6 inches high, lance-linear in outline, with 8—12 pairs of roundish, sessile leaflets ¼—¼ inches long. Fruit in several linear-oblong, finally roundish sori on each leaflet, placed oblique to the midrib. July.

5. A. THELIPTERO'DES. *Mx.* *Silvery Spleenwort.*

Frond bipinnatifid; *leaflets* pinnatifid, oblong-lanceolate, acuminate; *segments* oblong, obtuse, serrate-crenate; *sori* in parallel, oblique lines. A fine, large fern, on shady banks of streams. Fronds 1½—3 feet high, of an ovate-acuminate outline, on a slightly chaffy, pale stipe. Leaflets distinct and rather remote, narrow. 4—6 inches long. Segments rounded at the end, near ¼ inch long. Sori arranged in 2 rows on each segment, one on each side the midrib, convergent below, with shining, silvery indusia when young. Jl.

6. A. FILIX-FŒMINA. *Bernh.* Aspidium Filix fœmina & asplenoides. *Sw.* } A. angustum. *W.* }

Frond bipinnate; *leaflets* lanceolate, acuminate; *segments* oblong-lanceolate, deeply cut-pinnatifid; *ultimate segments* 2—3 toothed; *sori* reniform or lunate, arranged near the nerves; *stipe* smooth. A delicate, finely-divided fern in

moist woods. Fronds 1—2 feet high, with subopposite divisions. These are subdivided into distinct, obtuse segments which are themselves cut into oblong deep serratures, and lastly, the serratures are mostly with 2—3 teeth at the summit. Sori large, at first in linear curves, finally confluent, giving the whole frond a dark brown hue. July.

7. A. RUTA-MURA'RIA. *Wall-rue Spleenwort.*

Frond bipinnate at base, simply pinnate above; *leaflets* small, petiolate, cuneate, obtusely dentate above. An extremely small and delicate fern, in dry, rocky places. Frond 2—3 inches high, ½ as wide, smooth, growing in tufts, somewhat coriaceous. Segments usually 3 on each leaflet, less than ½ inch long. Stipe flat and smooth. Sori linear-oblong, slightly oblique, of a rusty brown color, finally confluent. July.

4. WOOD'SIA.

Sori roundish, scattered; indusium beneath the sorus, open, with a multifid or fringed margin, including the pedicellate thecæ like a calyx.

1. W. ILVE'NSIS. *Br.* Polypodium. *Willd.*

Frond pinnate, leaflets pinnatifid, lanceolate; *segments* ovate-oblong, obtuse; *sori* near the margin, at length confluent; *rachis* and *stipe* chaffy. Growing in tufts on rocks and in dry woods. Fronds 5 or 6 inches high, on chaffy and woolly stipes, most chaffy at base. Foliage 3 or 4 inches long, ⅓ as wide, oblong-lanceolate in outline, woolly or chaffy beneath, with opposite and alternate leaflets about an inch in length. The lower leaflets are pinnatifid, upper ones wavy on the margin or entire. June.

2. W. PERRIA'NA. *Hook. & Grev.* Hypopeltis obtusa. *Torr.*

Frond subbipinnate, minutely glandular-pilose; *segments of the leaflets* pinnatifid, *ultimate segments* roundish-oblong, obtuse, bidentate; *sori* submarginal; *stipe* somewhat chaffy. About a foot high, among and on rocks. Fronds lance-oblong in outline, 3 times as long as wide. Segments of the leaflets crenate-serrate, the lower ones distinct, upper confluent. Sori orbicular, becoming nearly confluent, each subtended by a half-round indusium notched into little teeth on the margin. July.

3. W. HYPERBO'REA. *Br.* *Flower-cup Fern.* Polypodium. *Willd.*

Frond pinnate; *leaflets* suborbicular, subcordate, 3-parted or incisely pinnatifid, cuneate at base, rough-pilose beneath. A very small species, much resembling the last, forming tufts on rocks. Plant 2—4 inches high. Fronds lance-linear in outline, on very scaly stipes. Leaflets 8 or 10 pairs, subopposite, nearly round, 2 or 3 lines in diameter, the margins only crenate above, deeply pinnatifid in the lowest pairs. July.

4. W. RUFI'DULA. *Beck.* W. ilvensis and Aspidium rufidulum. *P.*

Frond bipinnate; *segments of the leaflets* hairy, oblong, obtuse, pinnatifid, with obtuse ultimate segments; *sori* at length confluent; *stipe* and *rachis* hairy. Grows on rocks. Fern 6—8 inches high. Stipe dark brown, densely clothed with woolly hairs. Frond hairy both sides, its leaflets 4—8 lines long, lower ones distinctly pinnate, upper pinnatifid. July.

5. WOODWA'RDIA.

Sori oblong, straight, parallel with the ribs on either side of them; indusium superficial, arched or vaulted, opening inwardly.

1. W. ONOCLEOI'DES. *Willd.* W. angustifolia. *Smith.*

Sterile fronds pinnatifid; *leoflets* lanceolate, repand, slightly serrulate; *fertile fronds* pinnate, the leaflets entire, linear, acute. In swamps; not common. Fern about a foot high, growing in tufts. Barren fronds numerous, of a narrow-lanceolate, acuminate outline. Leaflets with decurrent or confluent bases. Fertile fronds fewer, with linear segments nearly covered on the back with the fruit in oblong, longitudinal sori $\frac{1}{4}$ inch in length. Aug.

2. W. VIRGI'NICA.

Frond pinnate, very smooth, the leaflets pinnatifid, lanceolate, sessile; *sori* in interrupted lines near the midrib of the leaflets and segments. In low woods and swamps. Frond about 2 feet high, on a smooth stipe, lanceolate in outline, and pale green. Leaflets alternate, deeply pinnatifid, with numerous, spreading, obtuse and slightly crenate lobes. Fruit arranged in lines along each side of the midribs both of the segments and leaflets. Jl. Aug.

6. PTERIS.

Sori in a continuous, marginal line; involucre formed of the inflected margin of the frond, opening inwardly.

1. P. AQUILI'NA. *Common Brake.*

Frond 3-parted; *branches* bipinnate; *leoflets* linear-lanceolate, lower ones pinnatifid, upper ones entire; *segments* oblong, obtuse. Common in woods, pastures and waste grounds. Fern 2—5 feet in hight, upon a smooth, dark purple, erect stipe. Frond broad-triangular in outline, consisting of 3 primary divisions, which are again subdivided into obtusely pointed. sessile leaflets. These are entire above, becoming gradually indented towards the base of each subdivision. Sori covered by the folding back of the margins of the segments. July. Aug.

2. P. ATROPURPU'REA. *Rock Brake.*

Frond pinnate; *lower leaflets* ternate or pinnate, segments lanceolate, obtuse, obliquely truncate, or subcordate at base. Fern 6—10 inches high, growing on rocks. Frond twice as long as wide, of a grayish hue, the two lower divisions consisting of 1—3 pairs of leaflets with a large terminal segment. All the segments lance-linear, distinct, with margins conspicuously revolute. Stipe and rachis dark purple, with dense, paleaceous hairs at base. Jn.—Aug.

3. P. GRA'CILIS. *Mx.* Cheilanthes. *Spreng.*

Frond slender, lanceolate, sterile ones pinnate, leaflets pinnatifid, segments broad-ovate, obtuse; *fertile* bipinnate, leaflets linear-oblong, crenate; *stipe* dark-brown. A delicate species, growing on rocks. Fern 4—6 inches high, smooth and shining in all its parts. Aug.

7. ADIA'NTUM.

Sori oblong or roundish, marginal; indusia membranaceous, arising from the reflexed margin of distinct portions of the frond and opening inwardly.

A. PEDA'TUM. *Maidenhair.*

Frond pedate; *divisions* pinnate; *segments* oblong-rhomboid, incisely lobed on the upper side, obtuse at apex; *sori* oblong, sublunate. This is, doubtless, the most beautiful of all our ferns, abounding in damp, rocky woods. Stipe 8—14 inches high, slender, of a deep, glossy purple approaching to a jet black.

At top it divides equally into 2 compound branches, each of which gives off, at regular intervals, 6—8 simply pinnate leaflets from the outer side, giving the whole frond the form of the crescent. Ultimate segments dimidiate, the lower margin being bounded by the midrib and the veinlets all unilateral. Jl.

8. DICKSO'NIA.

Sori marginal, roundish. distinct; indusium double, one superficial, opening outwards, the other marginal and opening inwards.

D. PILOSIU'SCULA. *Fine-haired Mountain Fern.*

Frond bipinnate; *leaflets* lanceolate, sessile; *segments* pinnatifid, decurrent, oblong-ovate, ultimate segments toothed; *stipe* a little hairy. A large and delicate fern, in pastures, roadsides, among rocks and stones. Fronds 2—3 feet high, in tufts, and remarkable for their numerous divisions and subdivisions. Stipe and rachis smooth, with the exception of a few soft, scattered hairs. Leaflets alternate, approximate; segments deeply divided into 4-toothed ultimate segments. Sori minute, solitary, on the upper margin of the segments. July.

9. ONOCLE'A.

Thecæ covering the whole lower surface of the frond; indusia formed of the segments of the frond, whose margins are revolute and contracted into the form of a berry, opening, but not expanding.

O. SENSI'BILIS. *Sensitive Fern.*

Sterile fronds pinnate; *leaflets* lanceolate, acute, laciniate, the upper ones united; *fertile fronds* bipinnate, with recurved and globular, contracted segments. Common in low grounds. Fronds about a foot high, the barren ones broad and somewhat triangular in outline, composed of broad, oblong, sinuate divisions the upper ones smaller, nearly entire, becoming united at base. The fertile frond is very dissimilar in its form to the others, resembling a compound spike, enclosing the fruit in the globular segments of its short divisions. Color dark brown. July.

10. STRUTHIO'PTERIS.

Thecæ densely covering the back of the frond; indusia scaly, marginal, opening internally.

S. GERMA'NICA. *Willd. Ostrich Fern.* S. Pennsylvanica. *Willd.*

Sterile fronds pinnate; *leaflets* pinnatifid, sessile; *segments* entire, rather acute, the lower ones somewhat elongated. A fern of noble size and appearance, growing in low woods and swamps. The sterile fronds are often 5 or 6 feet high, commonly about 3, numerous, in circular clumps. Stipes smooth, channeled; leaflets pinnatifid, with numerous segments, the lower of which are the more narrow and acute, all more or less connected at base. Fertile fronds few, in the midst of the sterile, much smaller, the leaflets with numerous, brownish, contracted segments, densely covered by the fruit beneath. Aug.

Tribe 2. OSMUNDIACEÆ.

Thecæ destitute of a ring, reticulated, striated with rays at the apex, opening lengthwise and usually externally.

11. OSMU'NDA.

Thecæ subglobose, pedicellate, radiate-striate, half-2-valved, collected on the lower surface of the frond or a portion of it, which is more or less contracted into the form of a panicle.

* Fertile fronds distinct from the sterile.

1. O. Cinnamo'mea. *Cinnamon-colored Fern.*

Sterile frond pinnate, leaflets elongated, pinnatifid, segments ovate-oblong, obtuse, very entire; *fertile frond* bipinnate, leaflets contracted, paniculate, subopposite, lanuginous; *stipe* lanuginous. This is among the largest of our ferns, growing in swamps and low grounds. Fronds numerous, growing in clumps, 3—5 feet high, most of them barren, the stipe and rachis invested with a loose, cinnamon-colored wool. The fertile fronds resemble spikes, 1—2 feet long, an inch wide. Leaflets all fertile, erect, with the segments covered with fruit in the form of small, roundish capsules, appearing, under a microscope, half-2-cleft. June.

* * Portions of each frond fertile.

2. O. rega'lis. *Royal Flowering-Fern.* O. spectabilis. *Willd.*

Fronds bipinnate, fructiferous at the summit; *segments of the leaflets* lance-oblong, distinct, serrulate, subsessile; *raceme* large, terminal, decompound. A large and beautiful fern, in swamps and meadows. The fronds are 3—4 feet high, smooth in all their parts. Leaflets or pinnæ opposite, remote, each with 6—9 pairs of leaves with an odd one. These are an inch or more long, $\frac{1}{4}$ as wide, obtuse, the petioles 0—$\frac{1}{2}$ line long. Above, the frond is crowned with an ample bipinnate raceme of a deep fulvous hue, with innumerable, small, globular, 2-valved thecæ entirely covering the segments. June.

3. O. Claytonia'na. *L.*

Frond pinnate; *leaflets* or *pinnæ* pinnatifid, the upper ones contracted and fertile. Smaller than either of the foregoing, found in swamps, Cambridge, N. Y. *Dr. Beck.* Fronds 12—18 inches high. Pinnæ oblong, obtuse, 2—4 inches long, tomentose in the axils. Segments entire. Each frond bears a terminal, bipinnate, rust-colored, erect panicle, covered with fruit. May.

4. O. interru'pta.

Frond pinnate, smooth; *leaflets* nearly opposite, pinnatifid; *segments* oblong, rather acute, entire; some of the intermediate leaflets fertile. A large fern in low grounds. Fronds 2—3 feet high, light green, interrupted near the middle by 2—4 pairs of fertile leaflets, which are so much contracted in size, as to resemble dense, compound racemes, and densely covered with small reddish brown thecæ. Stipe channeled, smooth above, chaffy at base. June.

12. LYGO'DIUM.

Thecæ sessile, arranged in 2-ranked spikelets issuing from the margin of the frond, opening on the inner side from the base to the summit; indusium a scale-like veil covering each theca.

L. palma'tum. *Sw. Climbing Fern.*

Stem flexuous, climbing; *fronds* conjugate, palmate, 5-lobed, lobes entire, obtuse; *spikelets* oblong-linear, from the upper fronds which are divided and

contracted into a compound spike. This is one of the few ferns with climbing stems, and the only one found in the U. S. Plant of a slender and delicate structure, smooth. Stem 3—4 feet long. Stipes alternate on the stem, forked, supporting a pair of fronds which are palmately divided into 5—9 segments. Fertile fronds terminal, numerously subdivided into linear-oblong segments or spikelets, with the fruit in 2 rows on the back. Mass. Rare. July.

Tribe 3. OPHIOGLOSSEÆ.

Thecæ 1-celled, adnate at base, subglobose, coriaceous, opaque, half-2-valved, not cellular, and destitute of a ring.

13. OPHIOGLO'SSUM.

Thecæ roundish, opening transversely, connate, arranged in a 2-ranked, articulated spike.

O. VULGA'TUM. *Adder's-tongue.*

Frond simple, oblong-ovate, obtuse, closely reticulated; *spike* cauline. A curious little plant in low grounds. Frond solitary, 2—3 inches long, ⅔ as wide, amplexicaul, entire, smooth, without a midrib, situated upon the stem or stipe a little below the middle. Stipe 6—10 inches high, terminating in a lance-linear, compressed spike, 1—2 inches long, with the thecæ arranged in 2, close, marginal ranks. Thecæ opening outwards and horizontally, becoming lunate, distinct, straw-colored. Vernation straight, not circinate. June.

14. BOTRY'CHIUM.

Thecæ subglobose, 1-celled, 2-valved, distinct, coriaceous, smooth, adnate to the compound rachis of a racemose panicle; valves opening transversely.

1. B. SIMPLEX. *Hitchcock.*

Stipe bearing the frond above; *frond* ternate, pinnatifid; *segments* cuneate-obovate, incised, unequal; *spike* subcompound, unilateral, interrupted. Grows in dry, hilly pastures, Ms. Frond sheathed at base, with a lacerate membrane, nearly simple, divided into 3 or more segments which are 1—2 inches long, often much dissected. Stipe or scape 3—6 inches high. Thecæ sessile. Jn.

2. B. VIRGI'NICUM. *Rattlesnake Fern.* B. gracile. *P*

Stipe with a single frond in the middle; *frond* twice and thrice pinnate, the lowest pair of pinnæ springing from the base; *ultimate segments* obtuse, somewhat 3-toothed; *spikes* decompound; *plant* subpilose. A beautiful fern, the largest of its genus, in low woods. Stipe or scape 1—2 feet high, bearing the frond about half-way up. This is apparently ternate, the lower pair of divisions arising from the base. It is almost tripinnate, the ultimate segments being decurrent and more or less confluent at base, with 3—5 cut serratures. Panicle terminal, 3—6 inches long, reddish tawny. June. July.

3. B. FUMARIOI'DES. *Willd.* B. obliquum. *Muh*

Scape bearing the frond near the base; *frond* in 3 bipinnatifid divisions; *segments* obliquely lanceolate, crenulate; *spikes* bipinnate. Native of shady woods and pastures. Frond of a triangular outline, 3—5 inches long and wide, of a stouter texture than the last, distinctly petiolate. Scape 8—12 inches high, bearing a tawny, compound panicle 2—4 inches in length, composed of numerous little 2-ranked spikes. Aug.

β. dissectum (*Oakes.* B. dissectum. *Willd.*); *frond* near the base of the scape, more numerously dissected, almost tripinnatifid.

ORDER CLXVI. CHARACEÆ. *The Chara Tribe.*

Organs of reproduction consisting of round, succulent *globules*, containing filaments and a fluid; and axillary *nucules* formed of a few short tubes twisted spirally around a centre, endowed with the power of germination.

Plant aquatic, submersed; *axis* consisting of parallel, tubular cells, either transparent or encrusted with carbonate of lime, furnished with leaves or branches consisting of verticillate tubes.

These are remarkable for the distinct current, readily observable with a microscope, in the fluid of each tube of which the plant is composed. The currents instantly cease when the plant is injured.

CHARA.

Globules minute, round, reddish, dehiscent, filled with a mass of elastic filaments; nucules (thecæ?) sessile, oval, solitary, membranaceous, spirally striated, the summit indistinctly cleft into 5 valves, the interior filled with minute spores.

1. C. VULGA'RIS. *Feather-beds.*

Stems and *branches* naked at base; *branches* terete, leafy at the joints; *leaves* (or *branchlets?*) oblong-subulate; *bracts* shorter than the fruit. A slender flexile plant of a dull green color, found in ponds and ditches generally stagnant. It appears in dense tufts, like a soft bed, undulating with the motion of the water. When taken out, it has an offensive odor. Stems slender, a foot or more long, with a verticil of about 8 filiform branchlets at each joint. Jn.

2. C. FLE'XILIS.

Stem translucent, naked; *branches* jointless, leafless, compressed; *nucules* lateral, naked. Found in ponds. Stockbridge, Ms., in company with Najas. Resembles the last, but the stems are shorter and more erect, nearly destitute of the verticils of branchlets. It is annual, as are also all the other species. Aug.

In Natural Order COMPOSITÆ, Tribe 5, *Cynareæ*, page 216, insert

CA'RTHAMUS.

Heads discoid; involucre imbricated, outer bracts foliaceous; flowers all tubular and perfect; filaments smooth; pappus 0; receptacle with setaceous paleæ; achenia 4-angled.

Arabic, *qorthom*, to paint; from its coloring property. Oriental herbs.

C. TINCTO'RIUS.—*Stem* smooth; *leaves* ovate-lanceolate, sessile, spinose-denticulate. Native of Egypt, but long cultivated in other lands on account of its orange-colored flowers. Stem branching, striate, 1—2 feet high. Leaves subamplexicaul, smooth and shining. Heads large, terminal, with numerous long and slender flowers. The latter are useful in coloring, and as a *nursery* medicine. July. Ann. *Common Saffron.*

CORRECTIONS, &c.

The difficulty of communication between the author and printer, while the work was going through the press, is our apology for the following inaccuracies. Those which immediately follow might mislead the student if not corrected.

Page.
4, line 24, erase "stem square, twisted, branching," and for "*Centaurella*" read GENTIANACEÆ.
22, l. 24, for "corolla" read petals.
24, l. 25, for "bear" read boar.—l. 34, for "white" read with.
27, l. 9, for "7" read 8.
29, l. 31, for "It is" read They are.
35, l. 35, for "CORYALIS" read CORYDALIS.
49, l. 33, for "petioloid" read petaloid.
52, l. 7, for "root-stalk" read rootstock.
60, l. 32, for "inverted" read inserted (omitting the comma).
93, l. 15, for "Achenia" read *Achenia*, and erase the period after it.
117, l. 26, for "They are" read It is.
118, l. 27, for "*Hair*" read *Hare*.
167, l. 34, for "tree" read true.
186, l. 10, should be read, Heads an inch in diameter, purple, numerous, &c.
251, l. 30, for "*Batterwort*" read *Butterwort*.
283, l. 12, for "verticel" read vertical.
295, l. 25, for "PURPUREA" read PURPUREUS.
299, l. 29, for "high" read long.
331, l. 26, for "Hippophæ" read Hippophae.
343, l. 48, for S. read F.
375, l. 29, for "tubes" read tubers.
396, l. 18, for "*biflora*" read *biflorum*; l. 20, for "*canaliculata*" read *canaliculatum*.
399, last line, for "segment" read segments.
433, l. 35, for "*Dorp*" read *Drop*.
443, l. 30, for "*Brown*" read *Brome*.

Besides the above, the following are obviously misprinted (by a single letter) in the places referred to; q. v.

Page.
7, CARYOPHYLLACEÆ.
11, last line, vesicles.
19, *ανεμος*.
24, l. 12, ovaries.
25, l. 34, 35, dehiscent.
27, l. 6, Cocculus.
29, l. 1, Cadophyllum.
30, l. 48, sepaled.
31, l. 25, unguiculate (also p. 48, l. 24); l. 27, placentæ; l. 30, persistent; l. 40, Tournefort.
36, l. 48, putrefaction.
40, l. 3, LACINIATA.
42, l. 36, elliptical; l. 37, equaling.
42, FENESTRALIS.
43, l. 14, sinuate (also p. 48, l. 18; 169, l. 11; 223, l. 37); ibid. cuneiform.
45, MATRONALIS.
48, l. 31, Cruciferæ.
49, l. 28, *frutescens*.
55, l. 33, *fertile*.
56, l. 20, cuneate.
64, l. 29, semidecandrum.
69, l. 36, Crypta.
72, l. 43, laciniate (also p. 308, l. 15; 351, l. 8).
76, l. 38, monadelphous.
81, l. 29, mucilage; l. 45, tomentose.
82, l. 36, mucilaginous.
83, l. 3, SYLVESTRIS.
91, l. 10, glandular (also p. 95, l. 25; 96, l. 3).
93, l. 8, *Dalibarda*.
97, l. 10 and 44, woolly.
100, l. 20, MOSCHATA.
103, l. 18, saxatilis.
117, l. 32, *trefle*.
120, l. 16, Marilandicum.
127, l. 27, irritability.
129, l. 18, TRIACANTHUS.
130, l. 6, carthaginian.
132, l. 45, linear.
139, l. 23, CÆRULEA, (also p. 177, l. 27); l. 45, *calabash*.
141, l. 37, 8, 9, colocynth.
142, l. 20, Astracan.
144, l. 15, peduncles.
145, l. 35, FLAGELLIFORMIS.
148, l. 20, 25, cuneiform (also p. 149, l. 41).
149, l. 26, *chrysosplenium*.
154, l. 4, cicely, (also p. 163, l. 17).
160, l. 29, FŒNICULUM.
167, SERICEA.
168, l. 38, 47, connate, (also p. 169, l. 11).
173, l. 5, similar.
174, l. 55, *Hedyotis*.
178, l. 14, occidentalis.
180, l. 37, paleæ, (also p. 186, l. 28; 209, l. 21). l. 39, cylinder.
184, l. 17, HYSSOPIFOLIUM.
185, l. 23, ageratoides.
204, l. 3, *pauciflora*.
208, l. 38, cultivated.
214, l. 35, canescent; l. 45, *stolons*.
222, l. 16, Taraxacum.
224, OLERACEUS.
230, l. 15, Uva-Ursi; l. 17, demulcent; l. 22, Gaultheria: l. 47, dissepiment.
247, l. 12, ciliæ.
259, l. 34, Pentstemon.
260, l. 24, *leucophæa*.
266, l. 23, Bartsia.
267, l. 41, lanceolata.
272, l. 18, *ισος*.
279, l. 31, vulgare.
280, l. 25, axil.
282, l. 39, verticils, (also p. 283, l. 31).
285, l. 7, Marrubium.
293, l. 43, album.
297, l. 14, 30, *Hyoscyamus*.
303, l. 42, corniculata.
315, l. 4, sinus.
329, l. 23, 29, *sandal*.
331, l. 37, foliaceous.
333, l. 24, Anonymos.
368, l. 22, Plurialis.
406, l. 36, *Rhyachospora*.

The following specific names are here corrected in accentuation:

Page.
31, A'DVENA.
54, TRI'COLOR.
84, SYRI'ACUS.
85, THURINGI'ACA.
144, GROSSULA'RIA.
165, HI'SPIDA.
224, FRASE'RI.
340, OBTUSI'LOBA.
370, PAUCIFLO'RUM.

A few generic names are also incorrectly accented. The reader is referred to the following INDEX for their correction.

The *exotic* species which occur in pp. 181—466 of the Flora are distinguished from other species by the typography;—they should have been so from the commencement.

INDEX

OF THE

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*** The names of the Orders are in CAPITALS,—of the Genera in Roman,—Synonyms in Italic. The figures after *Syn.* refer to the synonyms of the genus next above.

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